

THE IRON AGE

THE NATIONAL METALWORKING WEEKLY

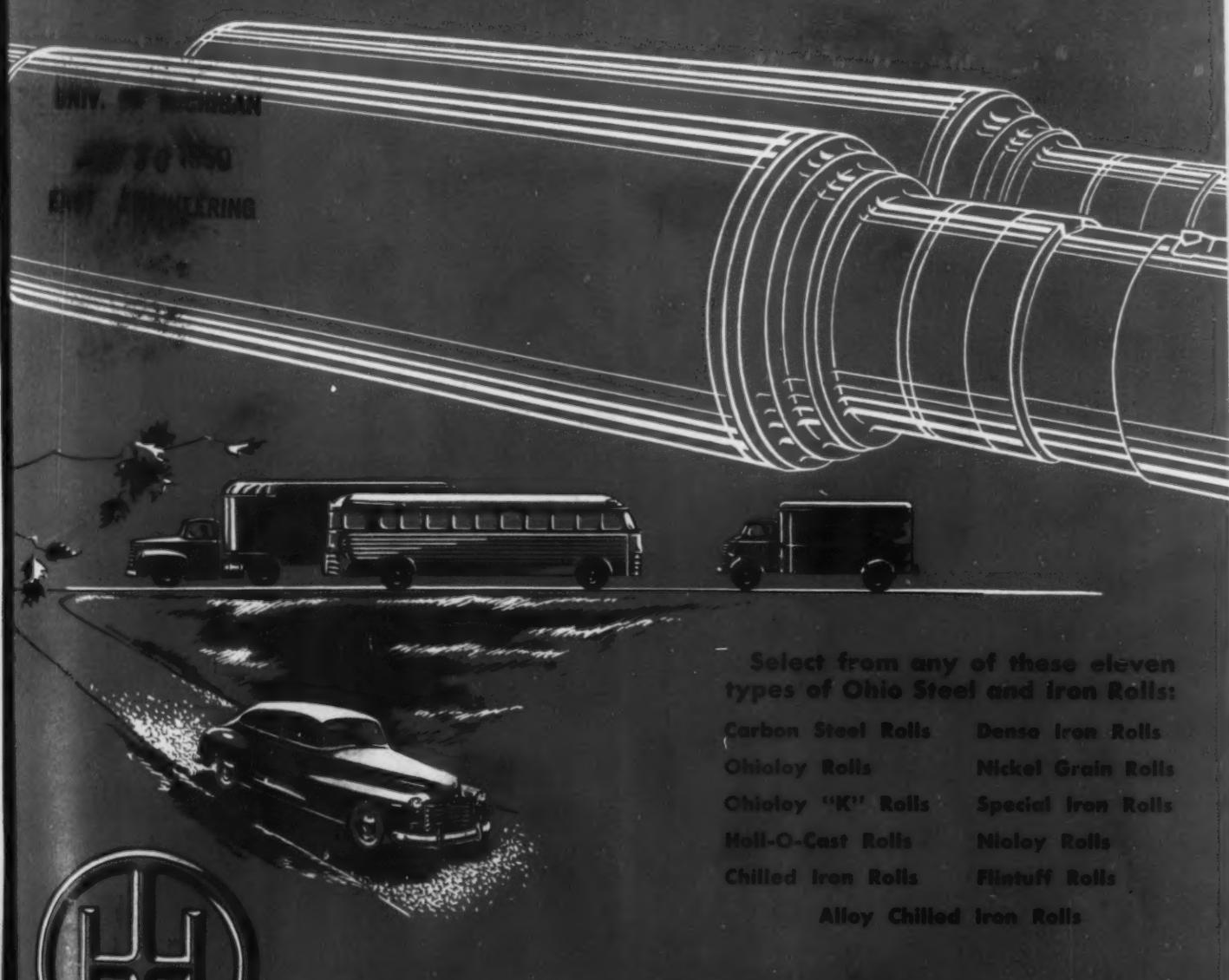
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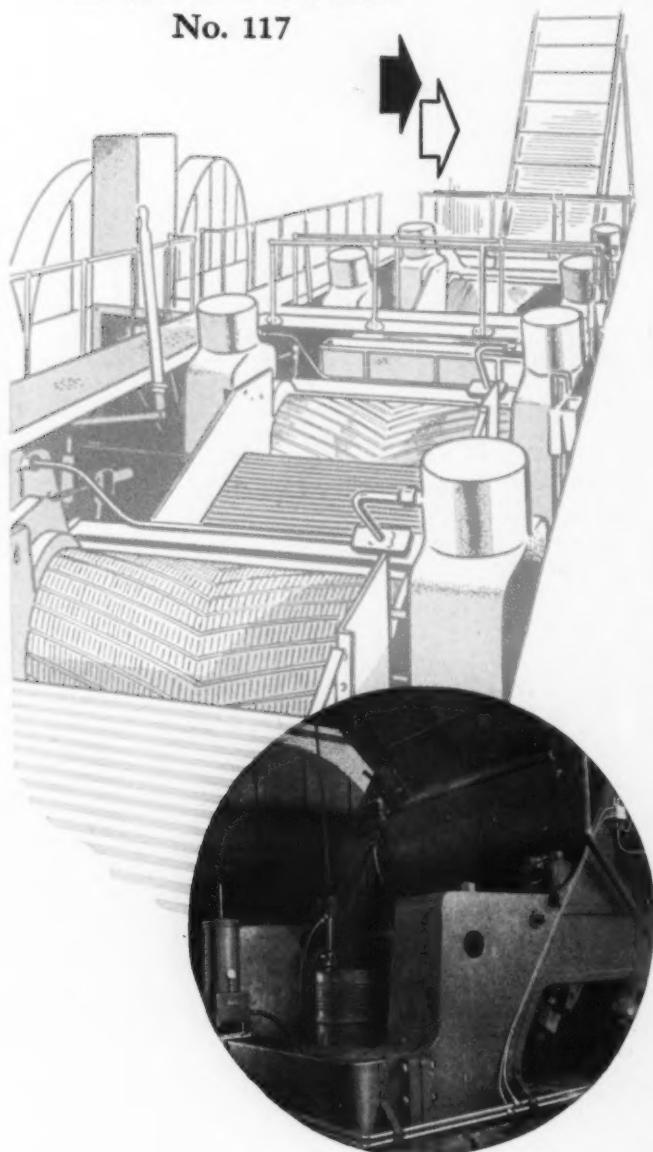
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Lubrication of sugar mill is
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FARVAL—Studies in
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No. 117



ANY sugar mill, new or old, benefits from Farval Centralized Lubrication. For Farval saves time and effort, increases machine efficiency, reduces bearing expense, and eliminates waste of lubricant.

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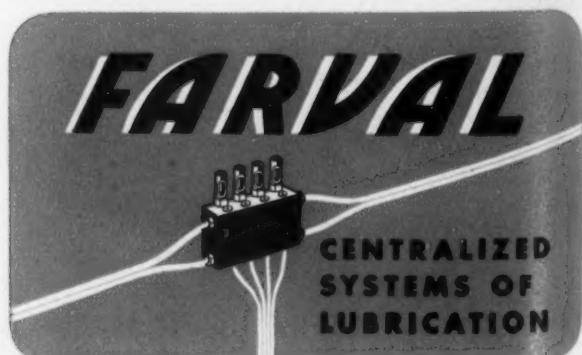
Older mills, too, can use Farval with profit. It is simple and easy to install a centralized system on any mill while it is down, during the off season check-up. And Farval pays for itself the first grinding season by the economies effected.

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This mill is typical of the many postwar improvements Bethlehem has made in its facilities for producing alloy steels. Also included are: modern soaking pits, hot scarfing machines, controlled-cooling facilities, heat-treating furnaces for bars in straight lengths and coils, and finishing facilities.

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THE IRON AGE

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Special Article



Using straight line production methods, Briggs is producing 3000 complex welded and chrome plated stainless steel auto assemblies per day. Stock is polished prior to forming. Installation features world's largest automatic machine for chrome plating stainless.—p. 65.

Issue Highlights



Kaiser-Frazer, eliminating wooden mockups, uses cast plastic models in a new technique for making drawings and body dies from designer's new car clay models. Simplified procedure increases accuracy and requires less than half the time formerly required to complete tools and dies.—p. 69.



Applications of tung oil to porous ferrous and nonferrous castings suppresses leaks due to micro shrinkage and micro gas porosity. Impregnation is practical and economical. Results are so reliable that subsequent pressure testing can be eliminated.—p. 76.



The non-integrated hand sheet mills have a new lease on life. A year ago it looked as if they had reached the end of the road. But today these same mills are booked solid for the rest of the year, could take on first quarter business if they wanted it.—p. 83.



In an effort to get sufficient steel scrap to maintain high level operations and still keep some sort of lid firmly clamped on domestic scrap prices several mills have bought substantial tonnages of European scrap. It is estimated that nearly 250,000 tons have already been acquired.—p. 85.



Machine tool builders aren't fooled by the pickup in new business. They know they have a tough fight ahead of them. They are constantly seeking new fields to apply their skill. And they have tackled a man-sized job of selling, not only industry, but also the public and government.—p. 88.

Coming Next Week



SAE has evaluated standard tool steels on a metallurgical basis. The arbitrary ratings are relative within types of steels. Selection of a particular analysis by physical properties in each group is possible with the assurance that each standard grade has a specific relationship with any other.

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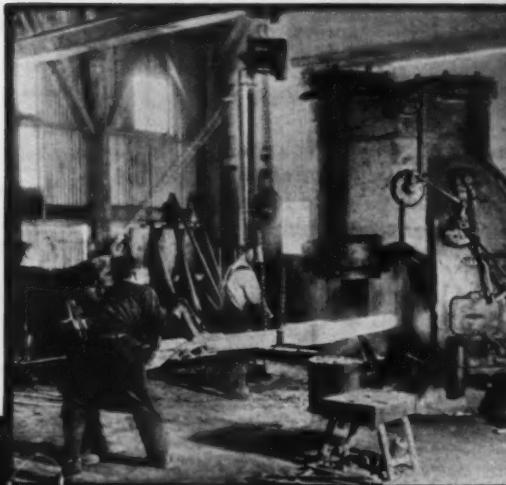
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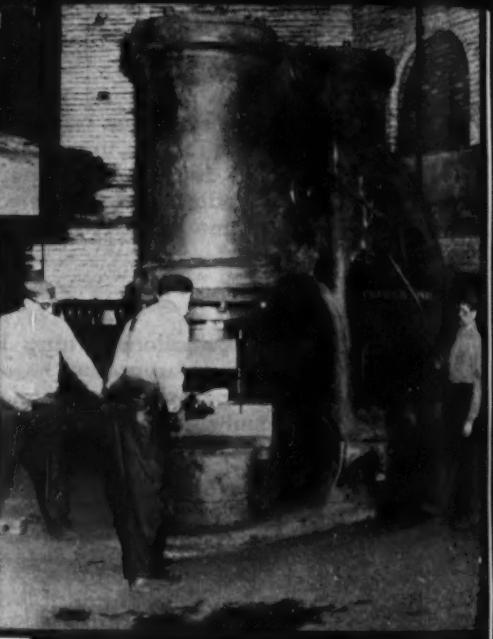
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Blacksmithing

*Parts
Forging*

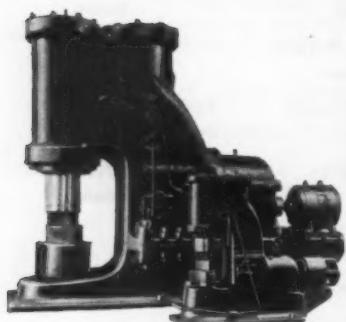


*Maintenance
Repairs*



THE VERSATILE HAMMER

SELF-CONTAINED • PNEUMATIC



The Chambersburg Motor Driven Pneumatic Forging Hammer is a self-contained forging unit that can be installed independent of steam or air lines and is capable of handling a wide variety of forging work from simple blacksmithing to machinery repair and maintenance work. It has a built-in motor driven air compressor and can be installed wherever electric current is available. Heavy anvil, high impact speeds, powerful blows and easy control of blows distinguish this versatile hammer. Sizes 200 lbs. to 5000 lbs. Write for a copy of Bulletin 16-L-9.

CHAMBERSBURG ENGINEERING COMPANY

CHAMBERSBURG

PENNSYLVANIA

Editorial

INDUSTRY VIEWPOINTS

The Cotton Wall

SOME one is going to pay for the inflation we are now enjoying. It may not be soon; it may take quite a while. But when the pay day rolls around it will be hard to take. You can't mortgage too much of the future; you can't get something for nothing and you can't do much with a dollar that buys less and less.

There must be some reason why people are overcome with the sugar and the honey that is spread over everything today. There must be a good reason why no one wants to look too far ahead to see what the final accounting will be.

Certainly anyone with an ounce of gray matter knows that a government cannot continue to spend more than it takes in—over a period of time. It isn't hard to figure that when everyone is paying the installment man the greater part of the salary check, a slight setback can have a chain reaction—a chain reaction that means unemployment and less wages.

It seems pretty clear too that the more wages wrung from management the more management must find ways to cut down on expenses. That means more machinery and a better way to do the job. If wages go too high too fast, a setback is in the offing. There is no way to pay for wages except by prices and by better output per man.

So even though we know all these things, why do they not make much of an impression? Inflation seems easier than deflation. Deflation hurts in a different way than inflation—but they both hurt about the same when an overdose of either is administered.

Maybe it is a cotton wall that does it. We would feel a stone wall. It would be something we could understand. A good bump on the head wakes us up to realities. But a cotton wall gives us the impression that things are fine—that everything will come out all right.

A cotton wall does not appear to hurt. In fact it feels good. But the cotton wall can be just as much a bar to progress as a stone wall. It just doesn't feel that way.



Editor

Do

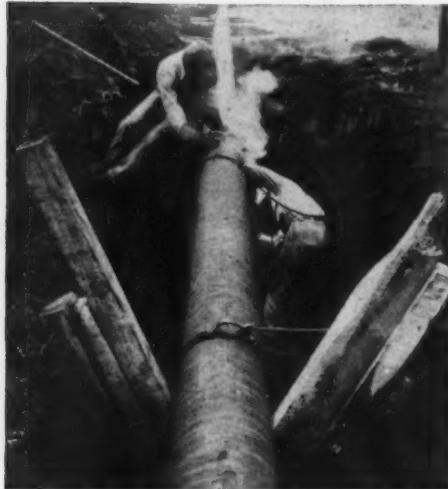
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TYPE W-22—AWS E6010, d-c reverse polarity, all positions; recommended for all types of joints in mild steel. Produces welds of excellent appearance, high tensile strength, ductility, and high impact resistance. Typical applications include pipe-lines, shipbuilding, structural frames, tanks and pressure vessels.

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Your G-E Welding Distributor maintains a complete stock of all G-E electrodes to meet your specific needs. Ask him for a copy of the handy, pocket-size G-E Electrode Catalog, GEC-482. Or write G-E Apparatus Department, General Electric Company, Schenectady 5, New York.

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NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

- Nodular iron is proving extremely versatile: Castings weighing 30 tons are being produced in this material and it has been successfully used in production runs of castings having sections as light as 3/32 in., and weighing only 1/3 of an ounce.
- Automotive engineers have been working hard since the war on front suspensions but only Chevrolet and Nash have made extensive changes. New designs feature fewer parts and lighter weight. One major producer has a new design ready but has held up production because of tooling costs.
- Warning letters have been sent out to users of titanium who might plan to descale the metal in molten caustic baths. Electrolytic action between titanium and the heat resistant basket may have been the cause of the one violent reaction reported.
- Foundries are beginning to take advantage of the low cost of the radioactive isotope Cobalt 60. While the technique is no cure-all, the isotope can be bought outright for less than \$100 from the Atomic Energy Commission. Rental on radium capsules with the equivalent in gamma ray emission runs from \$25 to \$50 per month.
- Tonnages of allocated scrap are increasing as available free scrap shrinks. Initially there was considerable vocal opposition by steel users to earmarking scrap but their protests have virtually died out in the face of tight sheet steel supply.
- Stainless grade 347 may have to be split into two standard types because of the increased tantalum content of ferrocolumbium. Tantalum benefits the high temperature properties but reduces the usual corrosion resistance of 347 at ordinary temperatures.
- Here are the things that are holding up auto demand: (1) 22 million over-age prewar cars; (2) 60 million jobs instead of 40 million prewar; (3) 150 million people instead of 135 million; and (4) more two-car families, particularly in the suburbs. Biggest factor of course is item (2)—20 million more jobs.
- At least one American turbine manufacturer may quote on several gas turbines to be used to drive blast furnace blowers. The fuel would be blast furnace gas. The inquiry came from Japan.
- Automobile company steel buyers who thought they were nicely fixed for steel are beginning to worry again. Reason is that their stocks are melting fast in the face of high production in their own plants and desperate pleas from their suppliers for more steel.
- One of the hand mills which makes steel sheets from imported sheet bars sent two metallurgists to Europe to tell its supplier how to improve sheet bar quality. Price of the imported sheet bar has been running about \$10 a ton below domestic delivered price to this mill but poor quality was running costs up.
- Spiraling lumber prices are causing a lot of concern to house builders whose booming business has been a big factor in strong demand for appliances and plumbing and heating supplies.



1850

The year 1950 marks
the One Hundredth Anniversary of

**THE CLEVELAND-CLIFFS
IRON COMPANY**

In entering the Second Century of our operations on the iron ore ranges in the Lake Superior District, we wish to express our deep appreciation to our employees, our customers and our shareholders for their contribution to the development of Cleveland-Cliffs during the years since the pioneering days of this company in the Iron Ore Industry.

**THE CLEVELAND-CLIFFS IRON COMPANY
CLEVELAND, OHIO**

1950



Steel Procurement Frenzied

More Price Boosts Reported

Ingot Rate Still 101.5 Pct

The Iron Age

SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THIS week the steel market is the center of a growing frenzy. Steel consumers are calling on every procurement trick they know to assure themselves of enough "precious" metal to keep their production lines humming at a record-shattering pace. And they insist that their own sales are keeping pace with their record steel consumption—that they are not buying for inventory.

A careful check of steel consumers and producers in all major market areas by IRON AGE editors reveals the following: (1) The number of new orders which consumers are attempting to place with the mills is not diminishing. (2) Steel production men will do everything humanly possible to keep production high during the hot weather and vacation months. (3) From the short-term viewpoint, steel demand is insatiable. (4) Long-term factors indicate a noticeable easing of supply, but this expected relief is some months hence. (5) There is a marked tendency among consumers not to admit satisfaction with their inventory of a metal which is known to be in short supply.

Customers Turn On Heat

Customers are passing through steel sales offices in a steady stream, urging, pleading and cajoling in their efforts to get more steel. One mill executive stated that he could fill the books on first quarter 1951 conversion in an hour if they were to announce opening of order books on conversion.

The pressure for hot and cold-rolled sheets is as intense as ever. Cold-finished bar demand has taken on more steam in recent weeks. Hot-rolled bars are still under quota control on a month-to-month basis. Pipe producers are sold out for the balance of the year, except for tonnage held back for jobbers, allotments. Orders for first quarter delivery on buttweld, lapweld and seamless are now being taken.

Structural fabricators are predicting one of the best years in the history of the industry. Some of them face order backlog extending

from 2 to 5 months. Fabricators other than structural report that business is running at a high level. They are having difficulty getting steel and are resorting to conversion and premium priced steel where the profit margin on finished products permits.

Record Tempo In Detroit

The record tempo of steel consumption in Detroit is continuing. It is now evident that auto production will tail off for model changes later than usual this year. Average delay is about 2 months. The reason, of course, is glowing sales reports. Some companies may hardly pause to catch their breath. Ford and Chevrolet are due for a face-lifting, with practically no interruption in output. Chrysler is due for a change but only Plymouth may make it this year. Most Detroit forecasters now look for a new all-time production peak during August. After that production totals are expected to fall noticeably.

Two small Midwestern buyers have notified a Pittsburgh supplier that they have built up their steel inventories and will not be in the market for as much tonnage as formerly. They are consumers of hot-rolled products such as bars and structurals. The mill attaches no significance to this development, but it has instructed its sales force to be on the alert for any more signs of an easing in demand.

Price Trend Still Up

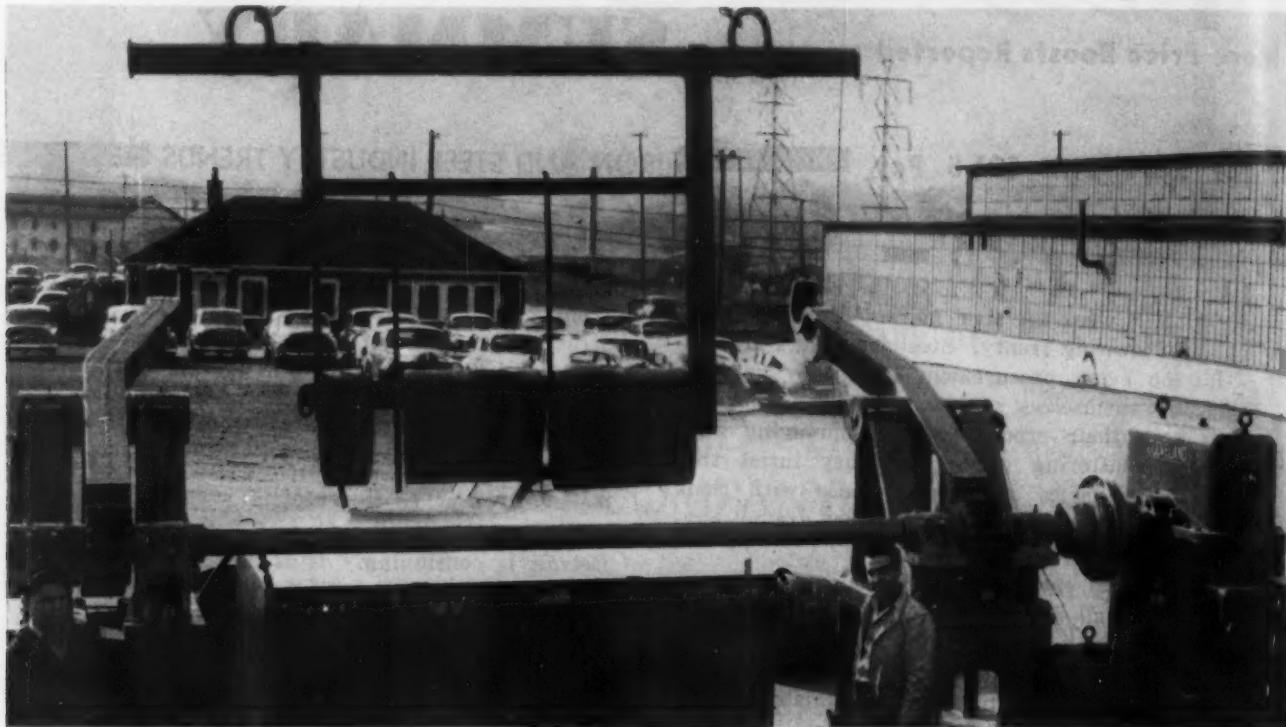
The price trend in steel is still up, although a general base price increase is still not expected in the immediate future. This week galvanized pipe producers announced increases of \$6 to \$8 per ton, reflecting recent zinc price rises. Two more small companies have raised cold-rolled strip \$7 a ton. Other mills, principally non-integrated operators, had made similar increases earlier.

For the sixth consecutive week steelmaking operations are scheduled at 101.5 pct of rated capacity. This will be the eleventh consecutive week the industry has kept its ingot rate at or above 100 pct.

(Nonferrous summary, p. 106)



**A LOW-COST COIL PICKLER
DESIGNED ESPECIALLY for
MEDIUM and LOW-TONNAGE MILLS**



THE WELDCO MECHANICAL COIL PICKLER SAVES SPACE • SAVES TIME CUTS OPERATING and MAINTENANCE EXPENSE

Here, at last, is an economical, space-saving Coil Pickler, built especially for smaller mills that do not have continuous pickling. The Weldco Mechanical Coil Pickler handles strip, rod, or wire coils quickly and easily, requires very little space, cuts manpower, maintenance and operating expense 20% to 40%!

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A fraction of the cost of a Continuous Pickler.
No elaborate fume removal system is needed.
Only small pickling and wash tanks are required.
Less auxiliary equipment to install because, in the Weldco set-up, the coil is not uncoiled, then recoiled.

LOW MAINTENANCE COST

Simple, fool-proof mechanism — designed for maximum efficiency.
No damage or wear on tank, because the coil never touches the tank.

LOW OPERATING COST

Less steam consumption, because of the smaller tanks.
Less manpower needed.
Greater flexibility — several different widths can be pickled at the same time.
No down-time, because there's no resetting of equipment for different sizes.
No hairpinning required — another big time-saver!

SAVES PICKLING TIME

The up-and-down, side-to-side motion of the coil in the pickling bath removes the loose scale quickly, resulting in a completely clean, uniformly pickled surface.

The Weldco Mechanical Coil Pickler is available in any capacity, to meet your individual requirements. (For successful pickling of strip, a satisfactory scale breaker and a loose coiler are required.) Contact our Engineering Department for complete details on this new, low-cost Mechanical Coil Pickler — for complete engineering service on your entire pickling line.

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Bulletin on SUPER REFRactories



NO. 8

by CARBORUNDUM

TRADE MARK

JUNE, 1950

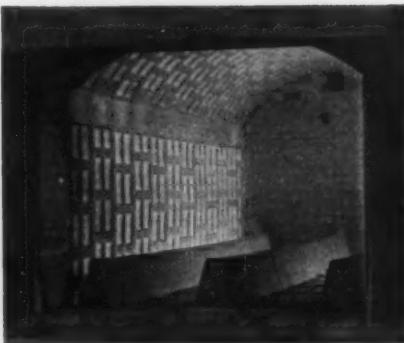
Are Super Refractories Limited to High Temperature Applications?

High temperature resistance is an inherent characteristic of super refractories by CARBORUNDUM. However, there are other properties which may be equally important reasons for selecting such refractories — for low as well as high temperature work.

The heat flow rate of CARBOFRAX silicon carbide refractories, for example, is practically the same (for the same temperature difference) at low temperatures as it is at high. Likewise, such properties as chemical stability, hot strength, wear resistance, and heat shock resistance are equally effective in low temperature jobs. Consequently,

refractoriness as such, often becomes a secondary reason for picking a super refractory, even where elevated temperatures are involved.

Lowered fuel costs, more production, and appreciably reduced maintenance expenses are all demonstrated benefits of these super refractories that have been realized for reasons aside from high temperature resistance. And although other refractories may be considered adequate from a life standpoint in many low temperature jobs, there is every probability that substantial savings can be effected by proper use of super refractories by CARBORUNDUM.



Muffle Performance Tells the Story

This photograph shows an ALFRAX electrically fused aluminum oxide muffle after six years in a porcelain enameling furnace. For four years, the furnace operated continuously on sheet steel and cast iron stove part production. Then, it was turned to stress-relieving work on heavy armor parts at a temperature of 1295° F. Loads of armor averaged 450 lbs. — were left in the furnace four hours. There were three loads a day, and during each change the temperature was dropped to 800° F. and then returned to its operating temperature.

After six years of this rigorous but relatively low temperature service, the only thing needed in this furnace was a new bottom! The low thermal expansion, chemical inertness and high cracking resistance of the ALFRAX tile kept the side walls and arch in first class condition — and without maintenance. Furthermore, high strength permitted use of thinner tile — aiding heat transfer through the muffle — and assisting fuel economy. Similar advantages are possible in other installations, involving either high or low temperatures.

Physical Properties of Super Refractories by CARBORUNDUM

Trade Mark

	CARBOFRAX Silicon Carbide	MULLFRAX Electric Furnace Mullite	MULLFRAX S Converted Kyanite	ALFRAX K Electrically Fired Alumina	ALFRAX B Electrically Fired Alumina	ALFRAX BI Electrically Fired Alumina
Heat Conductivity at 2200° F. in BTU/ hr. sq. ft. and °F. /in. of thickness	109 BTU	16 BTU	9 BTU	24 BTU	12 BTU	7 BTU
REFRACTORINNESS PCE CONE	37-40	38-39	37-38	37-39	39-40	38-39
SPALLING RESISTANCE	High	High	High	Good	Good	Good
ABRASION RESISTANCE	High	Medium	Medium	High	Medium	Low
THERMAL EXPANSION (25° — 1400° C.)	.0000044	.0000059	.0000069	.0000074	.0000086	.0000096
MODULUS OF RUPTURE @ 2440° F. PSI	800-3125	100-250	175-475	100-1050	100-225	50-100
WEIGHT 9 IN. STRAIGHT	9.25 lbs.	9 lbs.	8 lbs.	10.1 lbs.	7.25 lbs.	4.8 lbs.



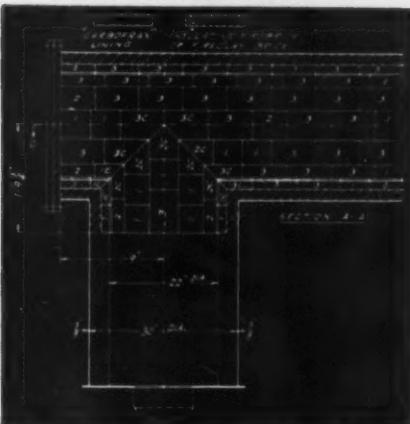
Uniform Heat Flow Required Here

Used over a varnish fire, this dome provides a soft, even radiant heat. This results from the high thermal conductivity of the CARBOFRAX silicon carbide material. Its use facilitates the "cooking" operation — extends kettle life. Resisting repeated heating and cooling, the CARBOFRAX dome gives longer service and reduces repair bills.

"Carborundum," "Carbofrax," "Mullfrax," "Silfrax," "Alfrax" are registered trademarks which indicate manufacture by The Carborundum Company
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Continued on other side →

Continued from other side



Hot Spots Eliminated in Flue Connector Linings

In the flue connecting a water-gas generator with its carburetor temperatures are relatively low. However, fireclay linings often erode in limited areas because of scouring by the coke particles. Hot spots develop and production must be interrupted for repairs.

Since they are exceptionally resistant to erosion at both high and low temperatures, CARBOFRAX silicon carbide tile are ideally suited for this application. They retain their original thickness much longer, even at tees, ell's and sweeps, where punishment is most severe. Also, the hard, dense CARBOFRAX tile resist carbon penetration and build-up. Elimination of expensive shutdowns, and of repeated repairs, quickly pays back the initial investment.

This is another example of where other specialized properties of CARBOFRAX brick and tile are more important than refractoriness.



Abrasion, the Main Problem Here

Abrasion used to be the principal problem of this furnace. Operated at temperatures under 2000° F., the floor was worn away when aluminum-bronze castings weighing up to 700 lbs were dragged across it. The resultant unevenness of the hearth caused the castings to sag during heat treatment.

The problem has now been eliminated by using CARBOFRAX silicon car-

bide tile with their high abrasion resistance. The floor remains level, and distortion of castings avoided. Furthermore the hearth is still in operation after more than three years — a life figure that compares with about one a year for other types of hearths.

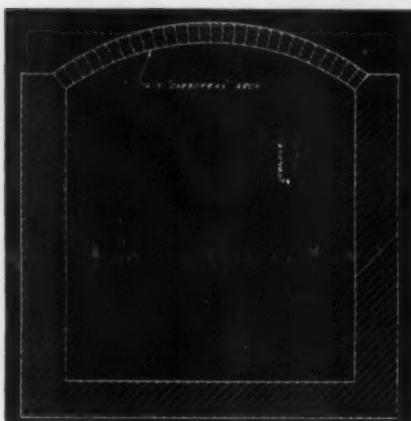
The high thermal conductivity of CARBOFRAX tile — another property equally useful at low temperatures — has also resulted in other improvements. First, more uniform and rapid heat delivery to the work chamber gives an improved heat treatment. Secondly, fuel consumption has been reduced. And, finally, the furnace can now be operated faster due to a quicker temperature come-back after being charged.



Here Again, Refractoriness of Secondary Importance

In this gas-fired artware kiln, the high thermal conductivity of the CARBOFRAX silicon carbide muffle comes into play. It permits more rapid and uniform heat delivery to the ceramic ware — with a consequent improvement in ware quality and a decrease in the number of rejected pieces. Moreover, it is unnecessary to maintain as high a temperature in the combustion chamber to secure the requisite heat in the working chamber — which means longer life for the other refractories — and lower fuel costs.

Other characteristics of CARBOFRAX tile important here are: High strength, which permits using thinner tile to further aid heat transfer; and high resistance to spalling and cracking which means long life in spite of repeated heating and cooling.



Super Refractory Picked for High Thermal Conductivity

This sulphur burner combustion chamber — shown in cross-section — is an interesting application of a CARBORUNDUM super refractory for a relatively low temperature job. The high thermal conductivity of CARBOFRAX silicon carbide brick is used to excellent advantage in the arch. Principally because of this feature it is possible to operate the unit at exceptional ratings and still maintain required temperatures of gases entering the Glover tower.

When a standard 9" thick fireclay arch is used in a burner of this type, approximately 1000 BTU's per hr. and sq. ft. are dissipated. A CARBOFRAX arch, however, dissipates approximately 4000 BTU's per hr. and sq. ft. This is due to the high thermal conductivity of the CARBOFRAX brick, and also because of the fact that their great mechanical strength makes possible an arch only 4½" thick. As a result, an extra ton of sulphur is burned each 24 hrs. per 24 sq. ft. of CARBOFRAX arch. Moreover, because of their low thermal expansion, inertness to furnace gases and absence of spalling and cracking, CARBOFRAX arches like this one are still in use after 18 years of continuous service.

To obtain facts and figures on installations in specific fields merely select from this list of bulletins. Copies will be sent you at once. No obligation, of course.

Super Refractories by CARBORUNDUM (general catalog)

Super Refractories for the
Ceramic Industry

Super Refractories for the
Process Industry

Super Refractories for Boiler Furnaces

Super Refractories for
Heat Treatment Furnaces

Super Refractories for Gas Generators

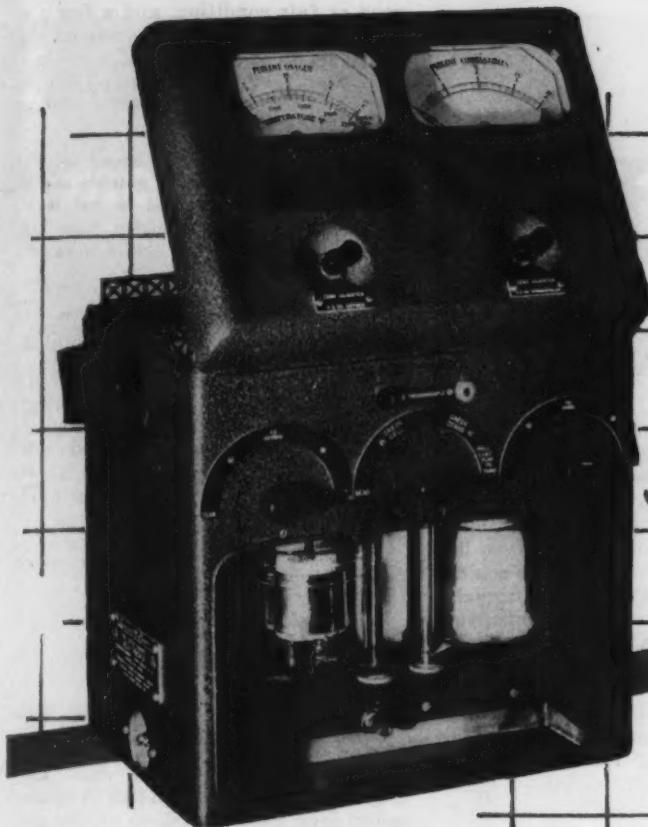
The Frax Line of Cements

CARBOFRAX Refractory Skid Rails

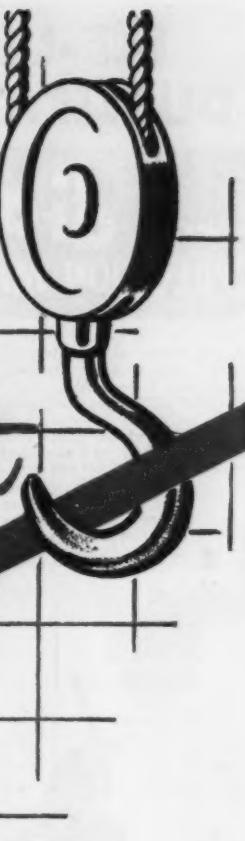
Porous Media for Filtration & Diffusion

Dept. No. B-60

THE CARBORUNDUM COMPANY
Refractories Division
PERTH AMBOY, NEW JERSEY



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Is excess (scale-making) oxygen present?

Are you paying needlessly to heat excess air?

Facts that answer these vital questions are promptly supplied by the Cities Service Heat Prover. This exclusive flue gas analyzer strictly checks combustion factors. Then sources of loss can be traced and corrected. Operators of all types of furnaces report they have been able to clamp down on cost and step up production, simply by using the Cities Service

Heat Prover. Find out how easily you can arrange to put it on the job. Send the coupon.

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| ★ Trojan Gear Oils | ★ Q-T (Quenching & Tempering) Oils |
| ★ Pacemaker Compressor Oils | ★ Tableway Lubricants |

 This coupon brings complete details in your copy of "Combustion Control for Industry."



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New York 5, New York

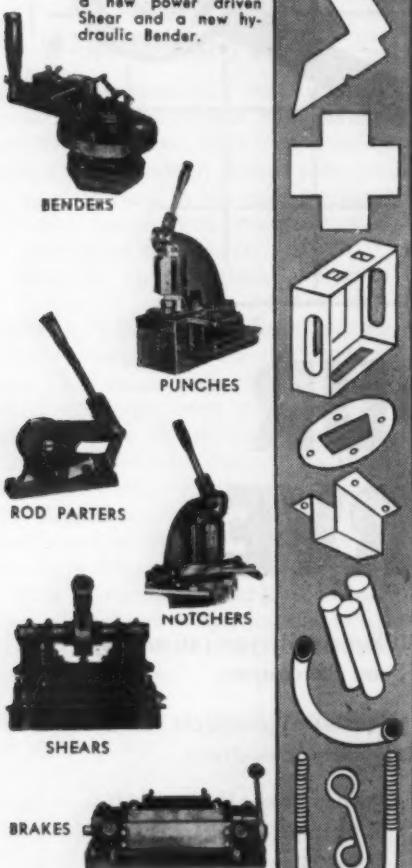
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Dear Editor

Letters from Readers

Steel Capacity Facts

Sir:

A line to compliment you on your timely, informative and courageous editorial in the June 8 issue of your splendid publication.

I hope all the public relations bureaus of the steel industry will see it and use it—it would be great if it could find its way into The Congressional Record through some representative who could use it in a speech in defense of the industry.

You are certainly doing a grand job in behalf of the steel industry, at least in my humble opinion.

"A MEMBER OF THE FAMILY"

Oops . . . Sorry!

Sir:

We have noted an article in the May 18 issue of THE IRON AGE in which reference is made to a "transite wall" and a "transite box," the brand name "Transite" being used without indication of its trademark status.

"Transite" is a registered trademark of Johns-Manville Corp. for certain of its asbestos-cement products, including asbestos-cement sheets, panels and wall constructions. It would be appreciated if, in future issues of your publication, every care be taken to insure that the brand name "Transite" is capitalized, quoted or otherwise identified as a trademark.

V. C. KLINE
Patent Attorney

Johns-Manville Corp.
Manville, N. J.

We slipped up on the use of the word "Transite," but are correcting our style books immediately to avoid a repetition of this incident.—Ed.

Bound Volumes Available

Sir:

The Fenn College Library has a long continuous run of THE IRON AGE, as follows:

Nov. 1905-Dec. 1909 (2 parts each year).

Vol. 85-124 1910-1929 (2 parts each year) (B).

Vol. 105-125 1920-1930.

Vol. 126-144 1930-1939 (2 parts each year) (B).

We wish to sell these, hence this inquiry to determine whether or not you can use them. Any reasonable offer will be gladly accepted. Bound items are indicated with (B). All are in

good or fair condition, and a few are in poor condition. Please quote on the entire set if at all possible.

E. STEFANCIC
Assistant Librarian
Fenn College
Cleveland 15

We have no need of the bound volumes for our own use, but quite possibly one of our readers would be glad to get them. Anyone interested in obtaining these volumes of THE IRON AGE should write Mr. Stefancic directly.—Ed.

Future Bosses Editorial

Sir:

We would appreciate very much, if available, receiving up to 35 copies of Tom C. Campbell's editorial "Wanted: Future Top Management," dated June 1. We think this is about the finest that has come out along these lines for quite some time, and how true.

L. A. BEHRENDT
Vice President
Joseph Dixon Crucible Co.
Jersey City, N. J.

Thanks for the kind comments.—Ed.

From West Point

Sir:

Reference article entitled "Cold Extrusion of Steel" published in the Aug. 4, 1949 issue of THE IRON AGE. The Dept. of Ordnance would like to obtain permission to use portions of this article in the pamphlets which we are preparing. We are also writing the Heintz Mfg. Co. for their permission and, if possible, a few glossy prints of any recent developments. You have already helped us out a great deal by furnishing us photographs for these pamphlets. Your help is certainly appreciated.

E. C. REBER
Colonel, Ord. Dept.
Associate Professor
United States Military Academy
West Point

We are always glad to help in any way we can, and permission is certainly granted for use of this material.—Ed.

For Dental Labs

Sir:

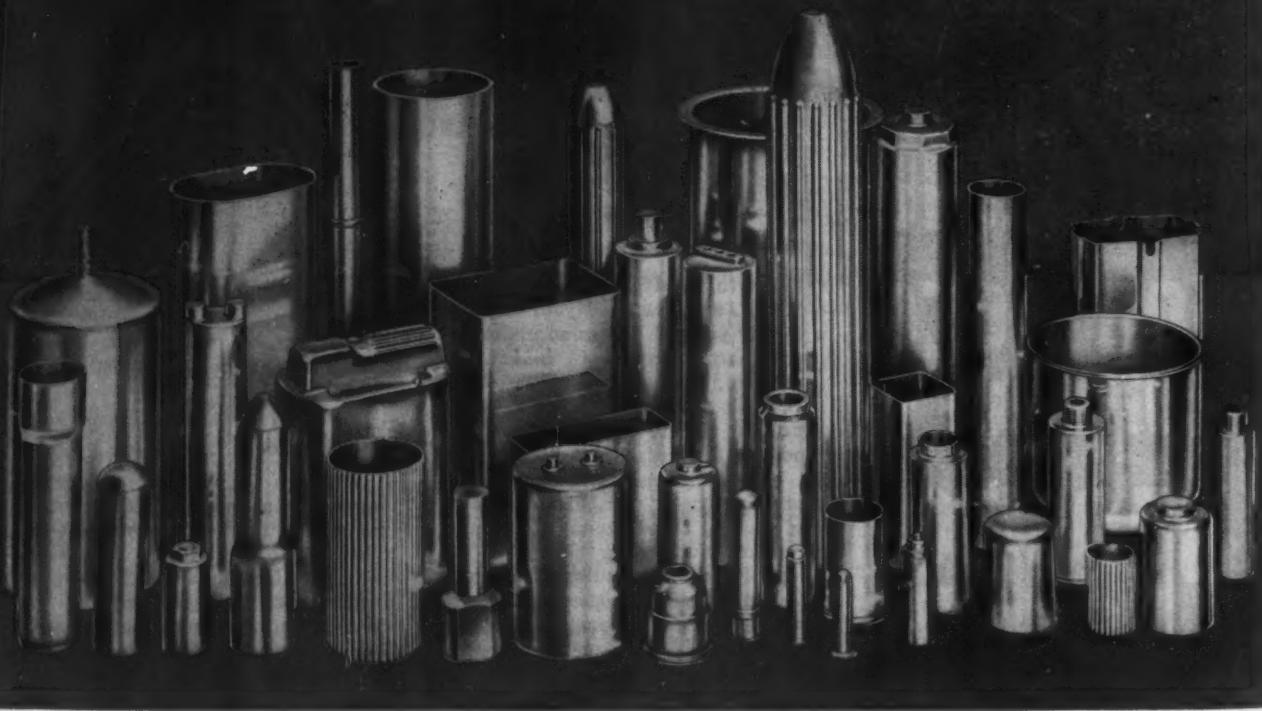
On pps. 94, 95 and 96 of your Feb. 16 issue you have an article entitled, "Investment Casting Magnesium." In this article you show pictures and comments on the grain structure of the metal. We in the dental field have been conducting a campaign featuring the importance of grain structure. In our house organ, which goes to about 600 dental laboratory men, we have featured this again and again.

Would it be possible to get the three photographs shown on the left-hand side of p. 95 of Lt. Davenport's article and also, may we quote the last two paragraphs on p. 96.

A. J. GRIFFIN
Sales Promotion Manager
Ticonium
Albany, N. Y.

We are glad to know that the article can prove helpful to you, and are happy to send the three photographs. You also have our permission to quote the last two paragraphs on p. 96 of that issue.—Ed.

means shapes like these cost less as Alcoa Impact Extrusions



Does your product use a component shaped like any of these? You can get it for less, as an Alcoa Aluminum Impact Extrusion. Less than stamping, spinning or drawing—and get all of aluminum's advantages as well. Because Alcoa bats out shapes like these in one swift stroke of a punch. This novel, low-cost method can work to your advantage if you design parts in accordance with suggestions made in Alcoa's booklet, "Alcoa Aluminum Impact Extrusions," yours for the asking.

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fluted, ribbed; up to 5 inches diameter, with a 6 to 1 length to diameter ratio (maximum length of 18").

Secondary operations can add threads, beads, flanges, other refinements at low cost, in the same Alcoa plant.

If you can see your product—or any part of it—as a symmetrical hollow shape, you can probably save money on it as an Alcoa Aluminum Impact Extrusion. Call your Alcoa representative, or write for your copy of our free booklet. ALUMINUM COMPANY OF AMERICA, 2143F Gulf Building, Pittsburgh 19, Pennsylvania.

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Fatigue Cracks

By CHARLES T. POST

Square Peg

Worth Steel Co.'s advertisement in the June 1 issue of your favorite family journal has come under the critical scrutiny of C. C. Finn of Seattle, who takes issue with Worth's statement: "No, we can't put a square peg in a round hole . . .".

Sizing up the illustration accompanying the ad, Mr. Finn acknowledges that the diagonal of the particular square peg shown is too long for the particular round hole shown. That's no reason for Worth to rush into generalizations, he cautions. If the square peg were a little smaller, Worth could put it into the round hole very easily.

The old saw, Mr. Finn points out, is that you cannot fit a square peg into a round hole. We'd like to warn the editorial department, by the way, that Finn also dislikes split infinitives, and suggests 30 days at hard labor with five lashes as fit punishment.

Aptronyms

General Electric's Karl M. Feier tag spontaneously reports that Fort Wayne's furnaces are sometimes supplied by the Blaising Coal Co. He modestly allows that his own name, translated from the German as "Holiday," might be an aptronym come July 4, then wonders whether Fatigue Cracks ever gets away from the Post.

But it remains for R. G. Leckie, Liquid Carbonic Canadian Corp. Ltd., to pass along a Montreal newspaper clipping proving that T. Tough is meat supervisor for the A. & P. up that way.

Law and Order

When your f.f.j. saluted Louis Polk, president of Sheffield Corp., last week, it noted that the American Ordinance Assn. had appoint-

ed him general chairman of technical divisions and committees. Subconsciously, the typesetter evidently sensed the close connection between gages, which Mr. Polk's firm makes, and law and order in production.

Puzzlers

Although the markets and price pages of your favorite family journal have the fastest publication schedule of any weekly magazine in the United States, Fatigue Cracks goes to bed a week early so as not to swamp the presses. That's why it's impossible to list the names of those who submit the correct answers to puzzlers in the same issue as the answers, themselves, are given.

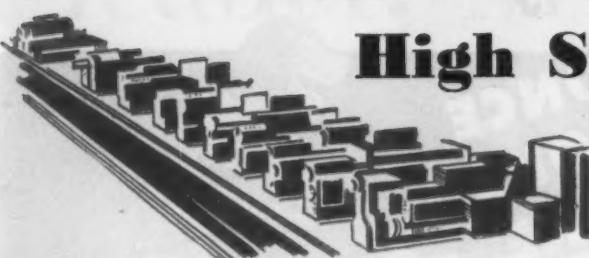
It didn't take long, though, for C. I. Gardner of New York and C. E. Norton of Highland Park, Ill., to break the long division code in the issue of June 15. Little time was lost in solving the clock hands problem in the June 8 issue by C. C. Finn, E. J. Sampson, E. M. Hoover, or Charles G. Heilman. Mr. Hoover and Louis Starr discovered how old Ann was June 1, and C. M. Williamson determined the cow's grazing area in the May 18 issue.

Space hasn't always permitted giving company affiliations and titles on those on our own Dean's List, but we can assure you they range from officers of the largest corporations to the last man on the routing list in the most remote shops.

Here's another cow problem. J. S. Coldwell of Globe-Union, Inc., Milwaukee, says it's impossible, so submit your work sheet if you get it: Tie a cow with a 100 ft rope to one of the posts in a fence around a circular 1-acre field (118 ft radius). Find the cow's grazing area. Moo-oo!

MACHINE TOOL

High Spots



*Sales
Inquiries
and Production*



By W. A. LLOYD

Narrow Profit—For some time there has been a feeling general in the trade that machine tools should sell for higher prices. Costs have been going up, and the business has on the whole too low a profit margin to maintain an active, competitive and growing industry. The feeling of both buyers and builders has been that advancing costs of materials, labor and component parts would force machine tool prices up by an average of about 10 pct during the summer.

Price Spiral—Last week in Detroit the upward price spiral began in earnest. Every day brings more reports of price boosts. Increases over the past month or two for basic raw materials have amply justified the 5 to 10 pct higher price tags, according to the trade.

Fabricators' prices are also going up, usually by about 10 pct. In the opinion of some industry spokesmen, last week's announced increases in corporation taxes are another factor tending to push tooling prices even higher.

Research Inadequate—The machine tool industry has been suffering ever since the end of the war from the lack of an adequate profit margin to finance the heavy research and development expenditures peculiar to the production equipment industries.

The machine tool industry has had to cut down on such very important work which is essential to increase the nation's productive efficiency and to maintain builders' products in a competitive position with respect to older equipment.

Air Force Request—One flagrant example that has been quoted previously is when the Army Air Force had to come to the tool industry with a request for a research project on the machining of the hard highly alloyed materials used for high temperature service such as in gas turbines and turbo superchargers.

Under optimum conditions this research should have been undertaken by the industry before there had been time for the government to raise the problem.

New Policy Needed—The results of a survey among large manufacturers, conducted by the National Machine Tool Builders' Assn. recently, have indicated that 80 pct of the bigger machine tool buyers in the country would replace their equipment at an earlier age than they are now doing, if they could charge off replacement costs before taxes at their own discretion.

The NMTBA holds that once such a replacement policy is adopted the amortization period should be adhered to consistently by the user.

Doesn't Jive—It has been estimated by Treasury officials that it would cost the government \$1.5 billion per year to return to the accelerated depreciation policy used prior to 1934 at the will of the taxpayer.

When Treasury regulation F was put into effect in 1934 in order to bring more income into the Treasury, it was said that a 20-year depreciation standard would net the government \$75 million a year. It is fairly obvious that there is an inconsistency between these two figures as far as Treasury realization is concerned.

The Small Can't—The big companies are even now depreciating their equipment on a 2-year basis when necessary, since the Treasury officials are aware that they have the strength, determination and financing to back up their decision on this matter. But smaller people cannot afford the expense and time of a costly lawsuit.

In Cleveland last weekend, Lees Bradner Co. conducted a sales school for its distributors.

Chrysler 6—Some sources say a plan reported earlier to move the Chrysler 6 to DeSoto has been shelved. Production of the present 6-cylinder engine will be continued at Jefferson, it now appears.

Informed sources now believe that a new V-8 will probably be built by DeSoto. Most observers in Detroit feel that DeSoto will eventually produce all of its own engines.

Transmission Snags—The Ford-Borg-Warner transmission program has struck some of the snags that are commonly encountered in getting into production on new transmissions. Some minor changes in tooling have been reported. Like all of the new transmission programs, production of the new Ford and Borg-Warner units is likely to be painfully slow in getting under way.

The page you're looking at now...

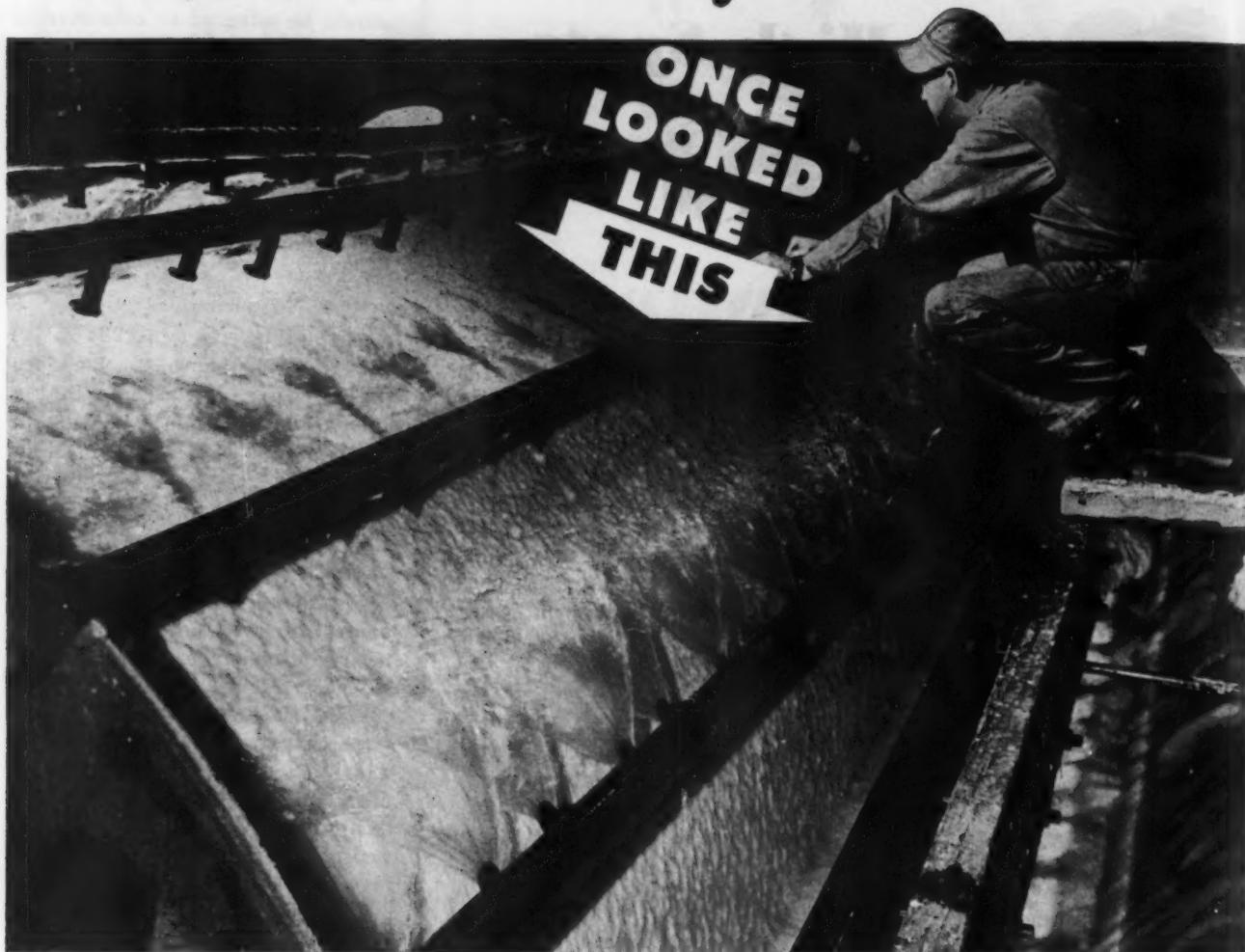


Photo Courtesy of Oxford Paper Company

Yes, that's paper pulp you see, above, running through the "washer" in a modern paper mill. And in its long journey from wood pulp to printing press, *paper depends heavily on COAL*. In fact, there's an old saying that "It takes a pound of coal to make a pound of paper."

Americans use a tremendous amount of paper in their daily lives . . . more than 330 pounds per year for every man, woman and child. And nearly *three-fourths* of all the heat and power used in papermaking comes from coal!

To meet the needs of the pulp and paper mills for low-cost heat and power, the coal industry provides a dependable supply of specified grades of coal. It is doing the same for other customers—railroads, steel, public utilities, cement, chemicals, food packers—and the coal dealers who serve millions of homes, farms and stores.

America's progressive coal operators are ever on the alert to provide better and better products for ever greater utilization. And to that end they

are investing huge sums in research, in mining equipment, and in preparation plants that not only keep coal competitive with other fuels but which also enable it often to surpass them!

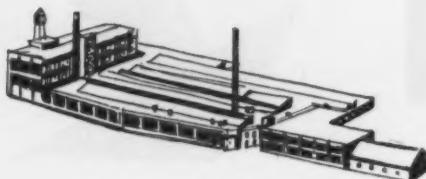
And that's a fine thing for America's future, when you realize that coal is the nation's most abundant fuel resource . . . the one fuel whose reserves are almost limitless.*

- *To continue to serve the nation's industrial and domestic needs for fuel, and to play its vital part in our national defense requirements, the coal industry seeks only the opportunities provided by fair and free competition.*

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Turn back to 1855. The first leg of Cyrus Field's Atlantic Cable had just been laid between Nova Scotia and Newfoundland. Gay Paree was even gayer with its International Fair. In the good old USA, the metals industry, a lusty lad, was already busting out of its knee britches.

It needed a medium for the fast exchange of news and ideas, technical and business information. *It needed THE IRON AGE.* And for 95 years, you might well say we have been the metalworking and metal-producing industry *in print* . . .

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PUBLICATIONS

Milling Tools Discussed

The overall economics of milling operations, characteristics of high speed steels, cast cutting alloys and carbide tool materials, and selection of a suitable tool material for a given milling application are some of the points covered in a new 28-p. booklet entitled "Efficient Milling." The report is a discussion of the facts which should guide both the cutter manufacturer and the cutter user in applying the available tool materials. Problems involved in manufacture, maintenance and handling of cutters made from the various materials are also reviewed, and a section is devoted to speeds, feeds and horsepower for milling cutters. *Metal Cutting Tool Institute.*

For free copy insert No. 1 on postcard.

Report on Precision

Details, including diagrams, of the care taken and methods used in casting and machining bronze aircraft engine parts to insure dimensional accuracy are contained in a new 8-p. bulletin. The folder describes fully the sequence for making and inspecting such parts from alloy containing 87 pct Cu, 11 pct Sn, and 2 pct Zn. *American Non-Gran Bronze Co.*

For free copy insert No. 2 on postcard.

Plastic Cutting Blocks

Colonial cutting blocks, made from tough but resilient Tygon plastic, offer cleaner, safer cuts, self-healing, longer life and quieter operation, and are usable on both sides. These and other features are described in an illustrated data sheet explaining how these blocks

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

pay for themselves quickly in longer die life, less frequent die sharpening and increased production. *Colonial Rubber Co.*

For free copy insert No. 3 on postcard.

Production Punches

The four models of Beatty toggle beam punches described in a new illustrated folder are designed to accommodate a wide range of special punching tools. Alternate tool equipment can be furnished in various styles to best fit the demands of work to be performed, die space can be modified and single or double stem punching is available. *Beatty Machine & Mfg. Co.*

For free copy insert No. 4 on postcard.

Foundrymen's Info

A new revised edition of "Useful Information for Foundrymen" is being offered for distribution to all interested persons. This handy pocket-sized booklet contains over 40-p. of helpful facts, figures, formulae, brick counts, fuel costs, etc., that answer the questions most frequently asked by foundrymen. Over 15,000 copies of the first three editions were distributed; this new printing was expanded to include a greater collection of practical data pertaining to various foundry operations. *Whiting Corp.*

For free copy insert No. 5 on postcard.

New Valve Line

Construction features of the new line of Parker swing check valves are shown by cutaway drawings in a 4-p. folder recently issued. Engineering data on various types are given, and charts are presented to illustrate minimum pressure drop and free flow characteristics. *Parker Appliance Co.*

For free copy insert No. 6 on postcard.

For Localized Lighting

Cut costs, help your workers see faster, easily and accurately through use of Localites, described in the new illustrated booklet entitled "Balanced Lighting." Get this informative booklet for the facts on industrial lighting and a description of the equipment featuring various models and adjustment joints, with fully enclosed wiring. *Fostoria Pressed Steel Corp.*

For free copy insert No. 7 on postcard.

Projects Reviewed

Commonwealth's annual report is an interesting review of projects completed, describing the complete research worked in 1949 on chemical, electrical and mechanical problems. The 22-p. booklet describes and illustrates typical case histories of new products, processes and production machines resulting from this research organization's extensive work.

Turn to Page 98

USE THIS POST CARD



NEW

PRODUCTION IDEAS

**New and improved production ideas, equipment,
services and methods described here
offer production economies.**

Core-Hardness Tester

An instrument for determining the relative surface hardness of cores shows on a direct-reading graduated micrometer dial the depth to which an abrading point enters the material during three revolutions and under a constant force. The corresponding hardness value for the depth of penetration is found from the table of Gordon-Campbell core hardness numbers. The instrument measures $2\frac{1}{2} \times 2\frac{1}{2} \times 5$ in. and weighs 1 lb. *Claud S. Gordon Co.*

For more data insert No. 13 on postcard.

Electrode Holder

A new insulated electrode holder combines advantages of tong and hole type holders in providing a strong, lock-jaw electrode grip and easy thumb pressure electrode release. Small size, light weight and perfect balance makes a comfortable holder to operate. The tip of the jaw end is covered with a high temperature resistant, asbestos base compound which is highly flexible; the tip cannot be broken by impact or shock of dropping. The cam jaw construction, open to one side of the holder, gives one position, 20° off vertical for down-hand welding, and a second position, 30° off horizontal for overhead welding. A hole in the jaw holds 18-in. center grip electrodes.

The holder is manufactured in 250 amp size for $1/16$ to $3/16$ in. electrodes. *Lincoln Electric Co.*

For more data insert No. 14 on postcard.

HOW TO USE: On each of the postcards below there is room for you to request further data on four items described on these pages. Please fill out one of the sections COMPLETELY for each item in which you are interested.

Corrosion-Proof Tubing

A new corrosion-proof instrument tubing is made of metal with a $1/32$ in. coating of extruded thermoplastic. The manufacturer claims that the thick, chip-proof plastic coating of this Dekoron tubing grips the tube tightly and protects the tubing from corrosion danger. The plastic coating is im-

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THE IRON AGE, New York 17

6/29/50

Fill in above
the number
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THE IRON AGE, New York 17

6/29/50

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further
data.

NEW

PRODUCTION IDEAS

Continued

mune to moisture, salt air, oils, acids and alkalies. Dekoron tubing, available in $\frac{1}{4}$ and $\frac{3}{8}$ in. diam, can be bent easily. The plastic coating can serve as color coding for the line. *Samuel Moore & Co.*

For more data insert No. 15 on postcard.

Large Motor Cooling

For cooling large enclosed motors, the Unit Cool'd design incorporates a finned tube air-to-air heat exchanger, comprising a single rectangular unit, located at the top of the welded-steel motor frame. A fan draws cooling air from outside the motor, through the tubes, and out the front of the motor enclosure. Air within the motor is passed over the finned tubes, cooled and recirculated.

HOW TO USE: On each of the postcards below there is room for you to request further data on four items described on these pages. Please fill out one of the sections COMPLETELY for each item in which you are interested.

Name	6/29/50	Name	6/29/50
Title	<input type="checkbox"/>	Title	<input type="checkbox"/>
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(Sec. 34.9 P.L.B.R.)
New York, N. Y.

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NEW YORK 17, N. Y.

Compact Low-Cost Pump

For pumping petroleum products and other light or viscous fluids in volumes to 85 gpm against pressures up to 150 psi, the new IMO series A313A pump has only three working parts—a power rotor and a pair of sealing or idler rotors that mesh with the power rotor in such a manner that the liquid is conveyed continuously from inlet to outlet. The pump can be direct-connected to electric motors, turbines or other high speed drivers without reduction gearing, belts or chains. All parts are interchangeable. It can be mounted in any position. *De Laval Steam Turbine Co.*

For more data insert No. 16 on postcard.

Immersion Thermocouple

A lighter, faster and easier-to-use immersion thermocouple for measuring molten steel is supplied in two forms. One has a 90° bend for electric furnaces, the other a 60° bend for easy insertion through openhearth wickets. Both have 6-ft handles. The immersion end, except the tip, is covered with a refractory compound. The complete assembly is 11 ft long and weighs 40 lb. *Brown Instrument Div. Minneapolis-Honeywell Regulator Co.*

For more data insert No. 17 on postcard.

Plug-In Panelette

A new Plug-In Multi-breaker Panelette consists of a 12 in. wide x 4½ in. deep box designed for easy wiring, door with locks, lugs from 4 to 28 circuits, and circuit breaker mains from 4 to 20 circuits. Thermal-Magnetic plug-in units are rated 15, 20, 30, 40 or 50 amp. The Panelette is offered as a companion to the NMO panel-board and is available for single phase, 3 wire or three phase 4 wire systems. *Square D Co.*

For more data insert No. 18 on postcard.

Pressure Indicators

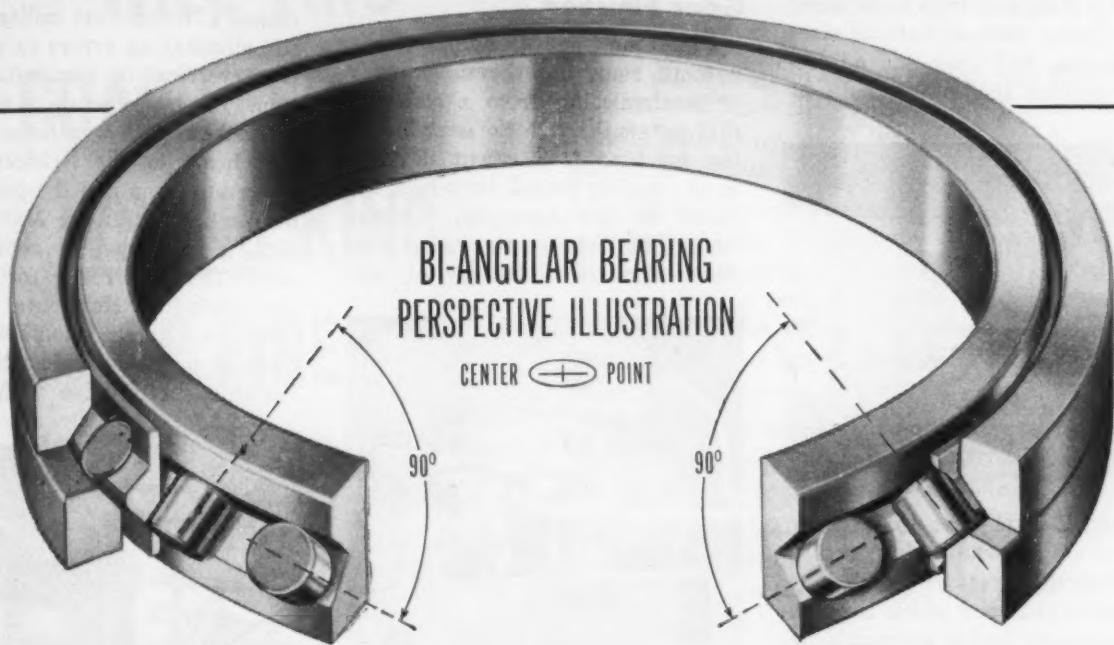
Precision pressure indicators measure maximum dynamic pressures of 500, 1000, 2000, and 3000 psi. These instruments reproduce pressure fluctuations in an engine cylinder with an accuracy of 1 pct. They make possible the investigation of ignition phenomena and pressure-power functions. The high natural frequency of its pick-up element gives it frequency response range that extends from static pressures to frequencies over 20,000 cycles per sec. For engine analysis the pressure pick-up unit is amplified for graphical presentation of the pressure time curve. *Control Engineering Corp.*

For more data insert No. 19 on postcard.

Improved Processing Line

Increased processing speed and simplification of operation result from a change in the drawbench of the Lomatic continuous drawing, straightening, cutoff and polishing

KAYDON BI-ANGULAR ROLLER BEARINGS



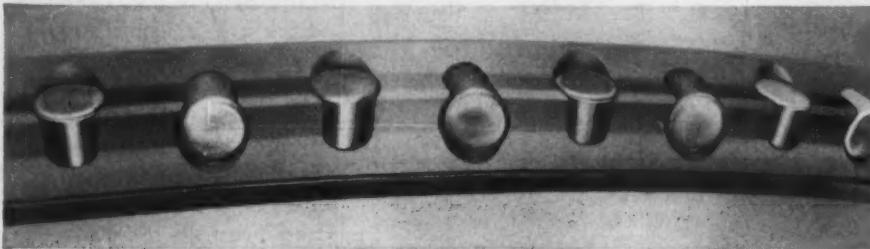
Does your bearing problem involve *both* thrust and radial loads? KAYDON BI-ANGULAR Roller Bearings are adaptable to various proportions of thrust and radial loads, as indicated below. These bearings are particularly suitable for low speed applications involving impact loads.

Whatever your bearing needs may be, KAYDON has *all* the facilities your engineers require. Whether you need only a few or many special bearings 4" to 120" outside diameter, or millions of high precision rollers, contact KAYDON for confidential counsel and cooperation.

ADAPTABLE TO EQUAL OR UNEQUAL THRUST AND RADIAL LOADS

For thrust loads *equal* from both directions, KAYDON BI-ANGULARS are made with every other roller reversed, as shown here. Adjacent rollers are at 90° angles to each other, permitting this bearing to take either radial loads or thrust loads, or a combination of both.

To handle heavy thrust load *greater* from one than the other direction, the bearing can be made with every second, third or fourth roller reversed, depending upon how relatively *unequal* the loads may be. Write for further detailed information.



31.000" x 34.988" x 2.000" KAYDON BI-ANGULAR Roller Bearings have been produced in large quantities and are successfully in use. They are further proof of KAYDON ability to design and make unusually large, precision bearings for specific needs.

THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

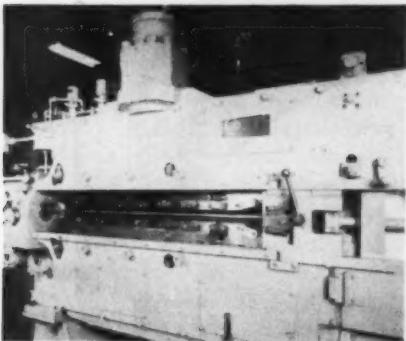
* ALL TYPES OF BALL AND ROLLER BEARINGS 4" BORE TO 120" OUTSIDE DIAMETER *

NEW

PRODUCTION IDEAS

Continued

line. No change of tools is required for gripping stock of various sizes and shapes, and only one adjustment—setting the lower chain at



the correct level—has to be made by setting one adjusting screw. The clamping pressure exerted by the chains that pull stock through the processing line is automatically adjusted in proportion to the actual pulling force. The line will operate at speeds up to 250 fpm, depending on the nature of the metal and the reduction required. *Loma Machine Mfg. Co., Inc.*

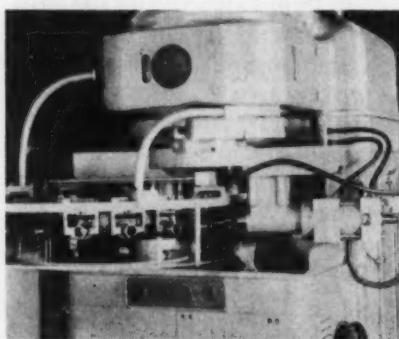
For more data insert No. 21 on postcard, p. 35.

Roll Turning Lathes

Cost-cutting, time-saving turning equipment is further broadened by two template-controlled engine lathes developed for the contour turning of steel mill rolls up to 20 and 15 in. diam. The new machines are small scale adaptations of the Monarch heavy duty roll turner. Overall economies are made possible by: Reduction of floor-to-floor turning time, ranging from 50 to 90 pct; use of carbide turning tools; template con-

Gear Finisher

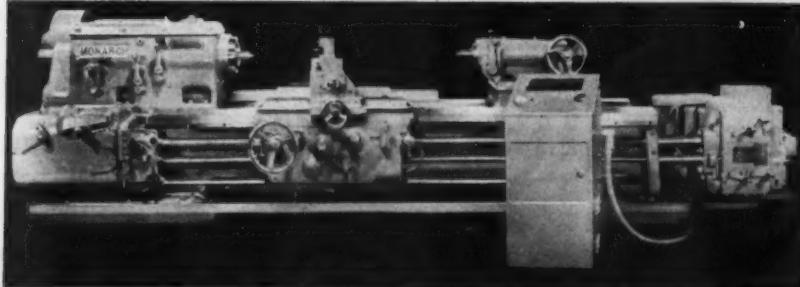
Finishing gears automatically without removing them, manually or mechanically, from a conveyer that passes through the gear finishing machine is a recent development. Spring loaded jaws hold the gears on the conveyer. Cluster gears can pass on the same conveyer through a battery of ma-



chines, each finishing a specific gear in the cluster, the conveyer providing the automatic transfer from one machine to the next. The conveyer carries the gear into position above the finishing cutter. All

trol of contour forming eliminating matching rolls in pairs; use of same template for both rough and finish passes. Rolls are turned on centers, permitting necks to be handled during the same setup. The Keller electrical contouring controls used consist of a magnetic clutch drive and feed change box, tracer mechanism, and pushbutton control. The headstock provides 16 speeds from 8 to 405 rpm with an 1800 rpm motor. *Monarch Machine Tool Co.*

For more data insert No. 22 on postcard, p. 35.

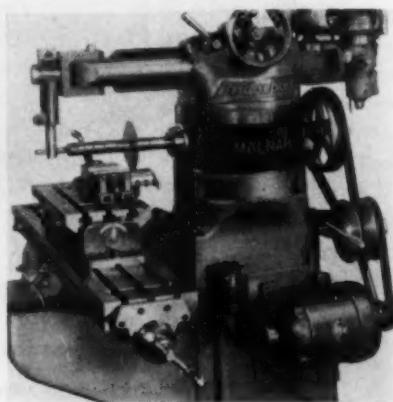


movements of the installation are electrically interlocked and automatically sequenced. *Michigan Tool Co.*

For more data insert No. 23 on postcard, p. 35.

Horizontal Milling Unit

The Malnar horizontal unit makes a Bridgeport miller universal, eliminating errors in resetting from vertical to horizontal operation. The job is set up as usual and worked vertically with the Bridgeport head, or the Bridgeport can be swung away and the job worked horizontally with the Malnar unit, that is permanently centered on zero. The unit ready for installation includes: Horizontal housing complete with precision spindle and Timken precision roller bearings; variable speed drive with pulleys



and belts; horizontal milling arbor support; 2-hp reversing switch; 1-hp 220-440 v 3 phase 60 cycle 1750 rpm motor; motor mounting base; and belt guard. *Malnar Machine & Tool Co. Inc.*

For more data insert No. 24 on postcard, p. 35.

Automatic Speed Controls

Automatic speed controls for the Link-Belt P.I.V. variable speed drive are job-engineered for automatically controlling the output speed range of the P.I.V. They are available in four basic types: electronic, hydraulic, pneumatic, and mechanical. Actuated by floating rolls and follower rolls, by floats and pressure diagrams, these controls automatically provide the energy to adjust the P.I.V. output speed by motor, piston or linkage. P.I.V. variable speed drives are available with these automatic controls, in eight sizes from 1 to 25

Turn to Page 100

WILL THIS COAL FEED THE WRONG KIND OF FIRE?

THOSE giant coal piles that stand next to power plants present little fire hazard in themselves. But when industry feeds its coal into pulverizing machinery to make a faster-burning, more efficient fuel, then sends it through ducts connecting pulverizers to storage bins—the picture changes! The fine coal particles ignite easily, burn fiercely—and flames inside the duct are almost impossible to get at.

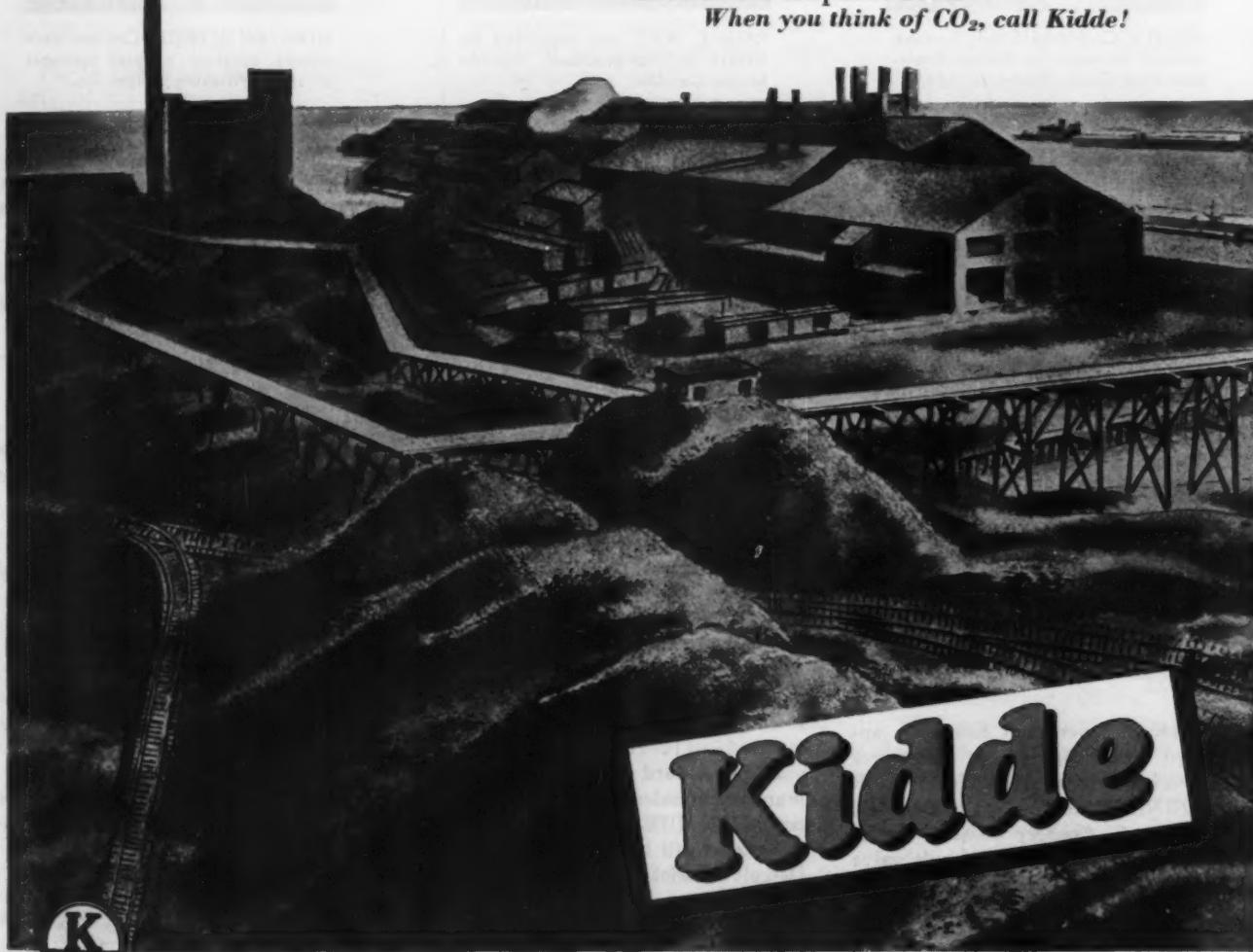
That hazard is taken care of in a mighty effective way at the East River Plant of Consolidated Edison Company of New York—by a *Kidde* automatic extinguishing system.

If a fire breaks out in the duct, the system goes into action fast. Pressure trips operate to close the duct dampers . . . flame-smothering carbon dioxide (CO_2) pours through *Kidde* Nozzles directly into the duct. The flames are out in a few seconds—and the unburned coal stays dry, clean, ready for use.

It's in cases like this—where hazards are toughest—that *Kidde* skill counts *most*. It will pay *you* to bring your fire-protection problems to us.

Your local *Kidde* representative is probably listed in the telephone book.

When you think of CO_2 , call Kidde!



Walter Kidde & Company, Inc., 650 Main Street, Belleville 9, N. J.

In Canada: Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.



Iron Age

Introduces



MELVIN C. HARRIS will become general manager of Eastern Stainless Steel Corp., Baltimore, Md.



PAUL E. WEST was appointed assistant to vice-president, Hudson Motor Car Co.



NORMAN J. FROELICH has been named assistant general manager of sales, Pittsburgh Steel Co.

Dr. Paul M. Erlandson, a specialist on guided missile and anti-submarine instruments, has been appointed chairman of the SOUTHWEST RESEARCH INSTITUTE'S physics department.

H. W. Hapman is president and general manager, and **Robert J. Brown**, vice-president, assistant general manager and treasurer of HAPMAN-DUTTON CO., Detroit. **Peter P. Ruppe** is assistant vice-president in charge of the Hapman Conveyors Div. and **J. David** is assistant vice-president in charge of the Dutton Boiler Div.

W. H. Thoreson received the appointment as director of overseas operations of the HUDSON MOTOR CAR CO.

Ralph F. Koeneman has been appointed chief engineer of passenger car engineering at AMERICAN CAR & FOUNDRY CO.'S plant in Berwick, Pa. **John C. Coonley** becomes assistant manager of the company's valve division.

Newton D. Howell, **Alwin A. Gloetzer** and **George A. Ellis** are all retiring from the New Departure Div. of GENERAL MOTORS CORP.

Dr. Arthur M. Edwards was named to the newly-created post of medical director of AMERICAN STEEL & WIRE CO. Dr. Edwards will administer the medical program for all plants including those of the Cyclone Fence Div.

Samuel B. Kingham and **Howard E. Isham** will become assistant comptrollers, U. S. STEEL CORP. OF DELAWARE, on July 1.

Clarence E. Muehlberg was appointed sales manager of gas products for the meter and valve division, ROCKWELL MFG. CO.

C. W. Craig and **C. E. Ericson** take over as manager and comptroller, respectively, of the North Chicago branch of ATLAS POWDER CO.'S industrial finishes department.

J. M. Gillard has been appointed manager of sales, wire and wire products, DETROIT STEEL CORP. **Tom R. Adams** will become sales manager, Detroit district sales office.

Floyd C. Pickett was named as assistant to the works manager, Fitchburg Works, GENERAL ELECTRIC CO.

G. W. Fine has been appointed assistant sales manager of U. S. STONEWARE CO.'S plastic coatings division.

H. W. Christensen, director of purchases, COLUMBIA STEEL CO., has been elected president of the Purchasing Agents Assn. of northern California.

Manford R. Lillengren has been appointed sales manager for BAER STEEL PRODUCTS, INC., of Auburn and Renton, Wash.

Wilmer H. Cordes, manager of market development and advertising of AMERICAN STEEL & WIRE CO., has been named general staff manager of the company's sales department. Mr. Cordes succeeds **Paul L. Lindsay**, whose appointment as Cincinnati district manager of sales is announced in this issue of THE IRON AGE.

Charles F. Stein has joined the DOEHLER-JARVIS CORP. as general purchasing agent.

T. S. Roderick has been named general manager of NON-FERROUS PERMANENT MOLD, INC., with headquarters at the company's offices in Mansfield, Ohio.

Appointments made by the board of directors of DEARBORN MOTORS CORP. include: Merritt D. Hill, vice-president and member of the board; G. D. Andrews, vice-president in charge of sales; Ralph E. Hunt, vice-president in charge of engineering and manufacturing; I. R. Kappler, vice-president in charge of purchasing; and James F. Pedder, vice-president in charge of advertising.

Hugh M. Nazor was made vice-president in charge of sales, Smithcraft Lighting Div., A. L. SMITH IRON CO., Chelsea, Mass.

L. J. Lange of INTERNATIONAL HARVESTER CO., has been appointed industrial power product specialist of that company. Mr. Lange succeeds S. L. Siegfried in this capacity.

K. H. Kingsley has been named to the post of general works manager of the export division, CHRYSLER CORP. Mr. Kingsley succeeds the late L. H. Perry.

E. B. Whittemore becomes manager of the specialty spring steel department of the COLD METAL PRODUCTS CO., Youngstown.

Jim C. Chase has been named manager of the recently expanded Dri-Cooler sales department of MARLEY CO., INC.

Promotions in the Wolverine Tube Div. of CALUMET & HECLA CONSOLIDATED COPPER CO. include: M. J. Cook, southeastern district sales manager; C. T. Fuller, southwestern district sales manager; A. R. Kaspark, head of sales promotion activities, Detroit; E. W. Ervasti, sales representative in St. Louis; and James Jolly, sales representative, Milwaukee and Wisconsin.



THOMAS A. FARRELL was appointed president of Dearborn Motors Corp., Detroit.

Iron Age *Salutes*

HAROLD F. JONES

"HACK" JONES is the new president of the National Assn. of Purchasing Agents, and he deserves the honor. As a matter of fact, he knows industrial procurement functions through practical experience on both sides of the buyer's desk.

Following graduation in 1931 from Pennsylvania State College (he received the degree of bachelor of science in electrical engineering), he spent the first 4 years of his business career in the sales division of Westinghouse Co. In 1935 he joined E. I. du Pont de Nemours & Co. at Wilmington, Del., where he got into purchasing work by way of sales.

Today he is in charge of machinery and equipment purchases at du Pont. Knowing how the fellow on the other side of the desk is likely to think on a given subject has already proven invaluable to him.

He first became a member of the Purchasing Agents Assn. of Philadelphia in 1940, and the active role he played in association affairs brought him the presidency of that group in 1947. The following year he served as national director. In 1949 he became a member of the executive committee of NAPA, also serving as financial officer of the association and vice-president of district No. 8.

"Hack" Jones firmly believes that a free exchange of ideas pays big dividends. That's why he is



an enthusiastic booster of NAPA's education program. He has been instrumental in developing local forum discussion meetings on topics of vital interest to purchasing men.

"The benefits of participation in meetings of this type are twofold," he says. "First, our discussion of the subject has increased our knowledge of it and, secondly, the mental stimulation stemming from the interchange of ideas has in itself increased our stature."

This explains why "Hack" is chairman of the development committee on education and a member of the NAPA committee on education. His experience in education should prove invaluable in his new post. We think he will make a good president and we wish him success.



JOHN F. MILLER has been elected vice-president of Illinois Tool Works, Chicago.



THOMAS M. CAMERDEN was named Pittsburgh district manager of sales, American Steel & Wire Co.



PAUL L. LINDSAY becomes manager of the Cincinnati district sales office, American Steel & Wire Co.

Eugene P. Reed has been made assistant to the general superintendent, ore mines and quarries division of the TENNESSEE COAL, IRON & RAILROAD CO. Succeeding Mr. Reed as superintendent at Muscoda is G. M. Neal. Taking Mr. Neal's place as assistant to the manager of industrial relations is Edward Henry Stevens.

Fred C. Keisser becomes export field manager and general assistant to the export manager of DAVEY COMPRESSOR CO. Steven R. Medin was made export staff translator and linguist for the export sales department.

S. H. Schachtel and William E. Ferrel joined the Cleveland executive staff of LURIA BROTHERS & CO., INC.

Daniel F. McGlinchey was elected as vice-president of PHELPS DODGE COPPER PRODUCTS CORP.

Raymond H. Cramer becomes general manager of the Hyatt Bearings Div. of GENERAL MOTORS. He succeeds the late H. O. K. Meister.

Organizational changes made by PHOENIX IRON & STEEL CO. and PHOENIX BRIDGE CO., subsidiaries of BARIUM STEEL CORP., include the following: R. Eberstadt, president; R. E. Craig, formerly assistant treasurer, now treasurer; J. C. Banser, formerly assistant secretary, now secretary; J. G. Coutant, assistant treasurer; C. H. West, assistant treasurer and assistant secretary; and William Cook, formerly sales manager, general sales manager. Named vice-presidents were three officers of CENTRAL IRON & STEEL CO., also a Barium subsidiary. They are William F. Zerbe, J. E. Jones and Alexius E. Eck.

Newly appointed manager of field electronic sales for WESTINGHOUSE ELECTRIC CORP'S electronics X-ray division is F. M. Fischer.

Harold E. Walker has been elected executive vice-president and a member of the board of directors of BOWEN PRODUCTS CO.

J. Williams Schaeffer has become head of the standards section of HUNT-SPILLER MFG. CORP., Boston. With the company since 1936, he has been in production standards work for its foundry and finished materials divisions since 1947.

John M. Neff, supervisor of ceramics at ARMOUR RESEARCH FOUNDATION of Illinois Institute of Technology, has been named assistant chairman of the ceramics and minerals department at the Foundation.

Dr. Lewi Tonks, physicist in the GENERAL ELECTRIC Research Laboratory, has been appointed head of the physics division in the Knolls Atomic Power Laboratory.

Donald B. Seem's appointment as advertising manager of the ELECTRIC AUTO-LITE CO. was announced recently.

Leonard H. Klaasen has been appointed assistant resident manager of the Grand Rapids plant, Fisher Body Div. of GENERAL MOTORS.

P. H. Neville, Jr., has been elected vice-president and comptroller of LEECE-NEVILLE CO., Cleveland. J. S. Allt has been elected treasurer. Mr. Neville joined the firm in 1942 and served as assistant secretary since last October. Mr. Allt, who has been associated with the company since 1937, was named assistant treasurer last October.

Gilbert V. Blanquart has been appointed supervisor, salary administration division, U. S. STEEL CORP. OF DELAWARE.

Mert M. York has been named manager of ALLIS-CHALMERS' Boston district office.

R. W. Johnson was appointed director of sales of the industrial gear division, FOOTE BROS. GEAR & MACHINE CORP., Chicago.

Frank V. Smith was appointed vice-president of the BRACH MFG. CORP., Newark, a GENERAL BRONZE CORP. subsidiary.

William W. McDowell was made head of all INTERNATIONAL BUSINESS MACHINES CORP. engineering and research, with headquarters in New York. Paul F. Manieri was named assistant to vice-president D. L. Bibby.

OBITUARIES

Joseph Anthony Krugler, 50, vice-president of Taylor-Wharton Iron & Steel Co., died on June 19.

H. O. K. Meister, general manager of the Hyatt Bearings Div., General Motors Corp., passed away on June 10.

Charles R. Moffatt, 63, former director of advertising for U. S. Steel Corp. and subsidiaries, died at his home in Glendale, Calif., on June 10.

Gen. Thomas Stevens Hammond, chairman of the board, Whiting Corp., Harvey, Ill., passed away on June 15.

Elmer Bisbee, construction engineer who retired 5 years ago from the Consolidated Steel Corp., died at Los Angeles recently.

MAKE A TON OF SHEET STEEL
GO FARTHER

Specify-

N-A-X
HIGH-TENSILE STEEL

SEVEN STRONG REASONS explain the
trend to N-A-X HIGH-TENSILE steel for:

- Bumpers ● Grilles ● Fenders
- Hoods ● Bodies ● Frames
- Wheels and other automotive parts



GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • ECORSE, DETROIT 29,
MICH. • UNIT OF NATIONAL STEEL CORPORATION

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Auto producers and oil refinery interests disagree on costs of premium gas . . . GM says cost estimates are too high . . . Wilson sees 8 million cars and trucks in 1950



By WALTER G. PATTON

Compression Ratio vs. Octane—The hottest controversy in the automotive industry today is fuels vs. engines. All car producers are committed to higher compression ratios requiring higher octane fuels.

Auto firms have already invested millions in new equipment to build new engines. They expect to invest millions more during the next couple of years and are naturally anxious to see that the oil companies "get going."

Doolittle with Dove—However, the oil companies are reluctant to invest more money in new refinery equipment. Recently, they dispatched World War hero, Gen. Jimmy Doolittle, now a vice president of Shell, to Detroit to soothe the impatient auto producers. Each

increase in octane number is more difficult to obtain, Doolittle argued. He said the rate of improvement in fuels will inevitably slow down.

Another spokesman for the oil industry argued that an increase in 10 octane numbers would cost the oil industry \$6 for every dollar it would cost the auto industry to change engines.

Fuel Cheaper—GM engineers say that many of the oil industry cost estimates are not justified by past experience. Their argument is that between 1920 and 1949 the oil industry has cut the cost of gasoline in half despite a gain of from 55 to 85 octane.

As a result of higher octane and higher compression ratios, the GM researchers explain, ton-miles per gallon of gasoline has jumped from 28 in 1930 to 39.5 in 1949. Meanwhile, the actual cost to the motorist per thousand miles has fallen from \$5 in 1930 to \$3.50 in today's dollars. If the prewar dollar is used, says GM, the fuel cost to the motorist is cut to \$1.75. Here is the complete tabulation.

Year	Cost Per Gallon	Research Octane Number	Ten Miles Cost Per Gallon	Cost Per Thousand Ton Miles
1920	.31	55	..	..
1930	.14	65	28	\$5.00
1940	.092	79	38	\$2.50
1949	.137	85	39.5	\$3.50*

*Equals \$1.75 on basis of prewar dollar.

There has been no public refutation of these figures, according to a GM spokesman.

Engines—Some sources say a plan reported earlier to move the Chrysler six engine to DeSoto has been shelved. Production of the present six cylinder engine will be continued at the Jefferson plant, it now appears. Informed sources now believe that a new V-8 will probably be built at DeSoto. Most observers here feel that DeSoto will eventually produce all of its own engines.

Transmission Snags—The Borg-Warner-Ford transmission program has struck some snags that are commonly encountered in getting into production on new transmissions, it is reported. Some minor changes in tooling have been ordered. Like all of the new transmission programs, production of the new Ford and Borg-Warner units is likely to be painfully slow in getting under way.

Not for Early '51—The possibility that the new GM transmission destined to replace Hydra-Matic might be ready by early '51 is now being heavily discounted. Best guess now is that the new unit will not be in volume production before late spring.

Auto Forecast—During the entire postwar period, the best forecasts on automobile production have been made by C. E. Wilson, president of General Motors.

Last week Wilson predicted that

8 million passenger cars and trucks will be produced in United States and Canadian plants this year. Market forecasters will do well to pay attention to this estimate. In the past GM's market forecasts have been sensationaly accurate.

Record Seen for August—Unless steel shortages or labor difficulties interfere, the auto industry appears to be reaching for an all-time peak output in August. Ward's is estimating a 700,000 unit output in June. Because of fewer working days, the agency sees a decline to 620,000 in July and an all-time record of 710,000 in August.

Ward's estimates a substantial decline will occur during the final 3 months of the year. Packard, Nash, Studebaker and Hudson are due for changeover shutdown. Plymouth may be ready to change models before the year end, Ward's says, but in other Chrysler divisions, tooling delays will not permit a changeover before 1951, according to this agency.

Most model changes this year will be "face-lifts." With auto sales rolling along merrily manufacturers are much too busy to think about new models. This has relieved the demands on machine tool suppliers who were previously being pressured into the earliest possible deliveries.

New Ford Plow—Turn an automobile company loose on a farm problem and some unusual answers may be forthcoming. For instance, last week Dearborn Motors Corp. announced a new moldboard plow that is specifically designed to (1) plow a wide variety of soils, (2) uses a small inexpensive "Razor Blade" share that is so inexpensive it can be used and thrown away, eliminating resharpening expense.

Lighter than Usual—Engineered to operate with the Ford tractor, the design is light compared with conventional plow shares. Most

of the necessary weight is in the mold board rather than in the cutting blade which is only half as large as the usual design.

According to Dearborn engineers, a plowing test on highly abrasive soil showed a cost of \$1.30 for conventional shares which required three resharpenings. With the "Razor Blade" plow, the cost per acre was only 59¢, Dearborn officials said.

Kaiser Soon to Roll—Production of the new "Henry J." is starting on schedule at the end of this month. However, K-F will have a big job of ironing out the assembly line kinks and sampling its dealers. Public introduction of the new models will be held in August —probably after the 15th.

Transmission Bandwagon—Nearly one-third of the automobiles built during 1950 will have automatic transmission. With Kaiser-Frazer, Studebaker, Ford, and Chevrolet in production dur-

ing the entire year, 1951 will see half the new cars equipped with automatic transmissions. Latest addition to the "easier driving" parade will be Plymouth which is expected to adopt Fluid Drive in the not-too-distant future.

Engineering Center—Substantial progress has been made in the construction of Pontiac Motor Div.'s new engineering center. The two-story structure will provide 213,645 sq ft of working area.

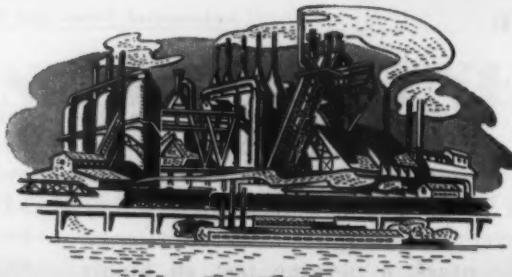
In addition to offices and laboratories, the new building will contain a machine shop, sheet metal, paint and wood-working shops. There will also be a dynamometer and a "durability room" for engine testing. Other facilities include a carburetor flow room, instrument laboratory, stress laboratory and a "cold room."

The laboratory will also have a "Quiet Room," a 700-seat auditorium and a spacious display room for Pontiac's complete line of cars.

THE BULL OF THE WOODS

By J. R. Williams





"NATIONAL" Ground Anodes control underground corrosion positively!

Losses due to underground corrosion *on pipe lines alone* are estimated at \$600,000,000 annually. Protect your buried or submerged metal structures, positively and economically, by installing "National" ground anodes.

Regardless of seasonal changes in soil resistance—regardless of whether the soil is wet or dry—"National" ground anodes afford perfect protection against corrosion.

They operate with a controllable electric circuit. In dry periods, simply raise the voltage. In wet periods, lower it.

"National" ground anodes have been used for more than 15 years. They outlast any other material. You don't have to dig them up every few years. For highest efficiency, pack "National" graphite backfill material around each anode in the bed.

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WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT



Not a Ripple—Reaction of western industrialists to President Truman's veto of the so-called basing point bill have been anything but volcanic. Apparently, business is so good for steel producers that the veto failed to have the impact it might have had 6 or 8 months ago.

In southern California, particularly, where major manufacturers are located close to their largest market, the f.o.b. mill system seemed to be working out satisfactorily for all concerned.

Some Absorb—Both U. S. Steel Corp. subsidiaries in the West—Columbia Steel Co. and Geneva Steel Co.—and Bethlehem Pacific Coast Steel Corp. have assiduously avoided freight absorption since the basing point system was abandoned.

However, Kaiser Steel Corp. and practically all of the other independents and small producers in the West are absorbing freight on shipments where it is necessary to meet competition.

Possible Reaction? — Some observers believe the delay in start of construction of the proposed cold reduction mill by Columbia Steel Co. in Los Angeles may have been attributable to a watchful waiting attitude on the government's final action on freight absorption and the basing point system.

It is obvious that the ability to compete in a larger market in nor-

mal times, would depend upon being able to deliver at competitive figures. The question is: Is it wise for U. S. Steel Corp. to invest \$25 or \$35 millions in a plant which could produce considerably more cold rolled steel than the southern California market could readily absorb?

On a strict f.o.b. mill price schedule, it would seem unlikely that products of such a southern mill could compete in San Francisco and the Pacific Northwest with similar products shipped by water from Atlantic seaboard plants.

Canadian "Tax Rush" — Recent publicity on the ease with which shippers can dodge the 3 pct freight tax by paying their bills in Canada, has given traffic men and lawyers of western steel companies something to think about.

There seems to be no question about the legality of sending a bona fide employee of a steel company into Canada to pay the Southern Pacific (which maintains a bona fide office in Canada) for freight hauled by that line in the United States and not pay the 3 pct tax.

Scrap Drops in July — In sympathy with the decline of scrap prices in the East, western prices are scheduled to drop \$1 a ton for steel-making grades July 1. Large buyers are informing the trade that beginning on that date they will pay \$21 per gross ton for #1 heavy, and \$19 for #2 heavy at Los Angeles and San Francisco.

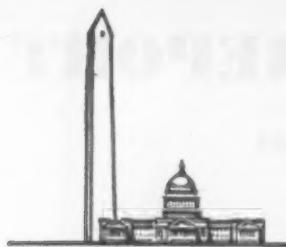
In addition, purchasers will pay one-half of the cost of bringing the scrap to the mills, in contrast to current practice of paying all of the freight from the shipping point. Temporarily at least, Seattle prices remain firm.

Fab Plant Opens — Seattle's Bethlehem Pacific Coast Steel Corp. fabrication plant won't have its grand opening until August 25, although some minor production work now is in progress. Approximately 25 persons are employed, with some construction work still going on.

Bethlehem Pacific sales department is moving into new offices this week, leasing the building that Puget Sound Sheet Metal Works occupied before that firm's plant was burned down more than a year ago. The new office space makes the sales department more centrally located between the main plant and the new fabrication plant.

Alaska Haul Time Cut — National Bulk Transport, Inc., is planning a new type transportation between the Pacific Northwest and Alaska calling for use of a converted tanker to carry 91 fully-loaded railway boxcars between the two locations.

Loaded cars heading for Alaska will be brought aboard the tanker at Tacoma, Wash., where the transport company is reported to have taken a 30-year lease on its loading site, and unloaded at Whittier, Alaska.



THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

FTC on Spot—New hope for settlement of industrial pricing problems is now centering around the Federal Trade Commission. However, if FTC past policy is any guide the situation will remain clear as mud.

Chairman Johnson, D., Colo., of the Senate Commerce Committee, last week set up a "watchdog committee" to "ride herd" on the FTC pending a clarification of laws applying to freight absorption.

Time Is Short—Key members of Congress believe there is not enough time remaining in the present session of Congress to pass legislation straightening out the tangled freight-absorption issue.

Johnson told the commission last week that he may sponsor new legislation unless the agency "responds to the demand of Congress" for clear-cut settlement. He said he was sending a series of questions to the FTC, and expressed the hope that "forthright answers" would "give businessmen further assurance of the legality of their competitive pricing practices."

Holiday for Suits—In the House, Rep. Walter, D., Pa., continues his campaign for legislation declaring a moratorium on FTC pricing suits.

A 1-year "holiday" for business from FTC litigation against freight absorption practices would give the federal courts and the FTC an opportunity to "clear the air" in this hot issue, he contends. The success of such legislation remains doubtful.

Political Veto—President Truman's veto of S. 1008, the delivered price bill, was based on the simple proposition that the Fair Deal would lose less political sup-

port with a veto than it would gain if the bill became law.

The President was in the middle of a squeeze play, since the measure was supported by some of the warmest supporters of the Fair Deal on Capitol Hill and opposed by others. Another sidelight attending this veto, from which business should take a lesson, is that inter-government lobbying and propaganda are still very effective.

Anti-Bill Forces—The campaign to defeat this legislation was led by Rep. Wright Patman, Dem., Texas. He stirred up many retail, farm and labor organizations by waving the Robinson-Patman Act in front of them.

That S. 1008 had no damaging effect on this law made little difference. The whole campaign was based on theory that if the "big lie" is repeated often enough it will be believed.

Sheep's Clothing?—Mr. Patman, Chairman of the House Small Business Committee, has long been a self-anointed protector of small business. It is significant, however, that the top official of the National Retail Hardware Assn. recently informed a Congressional Committee that Mr. Patman is "an enemy of small business" rather than a "friend."

This is borne out by Mr. Patman's campaign against S. 1008, for if the confusion regarding freight absorption and delivered

By EUGENE J. HARDY



prices is allowed to remain, local monopolies in heavy industry are the ultimate outcome.

Higher Taxes—You might as well start planning now for a boost in your company's tax bill—if the firm is making more than \$166,667 a year. If your intake is below \$166,667 annually you will receive a small tax cut.

In addition, you will have to begin to pay your Federal taxes faster, so that at the end of 5 years you will be paying corporate income taxes within 6 months of the end of tax year instead of the present 12 months. You are also going to be confronted with withholding a 10 pct tax on dividend payments to stockholders.

Passing Probable—Present indications are that the Senate will approve the House-passed bill cutting excises and boosting corporate tax burdens, the latter designed to provide a net increase in revenue of about \$433 million a year.

Only the Brave—While there is talk in the Senate of trimming the corporate taxes approved by the House, it is apparent that the Senators cannot cut the proposed new rates too deeply if they are to get out a bill that will be signed by President Truman.

In fact, it will be a brave Senator who will speak out against the higher corporate rates since they are vital to the passage of a bill cutting consumer excises.

MECHANICAL GIANT

Plates Chrome on Stainless

By H. E. HEAD, Plating Technician,
Briggs Mfg. Co., Detroit

WHEN asked to quote on the manufacture of a welded assembly of stainless steel to be finished with an electro-deposited coating of chromium plate, Briggs Mfg. Co., Detroit, began experimenting to determine how the job could best be done. Chromium baths have a very low throwing power and stainless steel has low conducting ability; in addition, the assembly involved was some 5 ft long and 2 ft high with more than a fair amount of recessed areas.

Among the first considerations were production demands of 3000 assemblies per day. This indicated the desirability of fully automatic equipment. However, due to the size of the assembly, any machine would have to be a very large installation. The plating racks would need to be at least 5 ft long and would have to be equipped with auxiliary anodes to insure deposition of plate in the recessed areas. Because of the high currents required, very large copper conductors were essential to assure proper distribution of current to all parts of the assembly. This meant that the racks would be too heavy to remove from the machine.

The size and shape of the plating rack directly governed the size of the plating tank, and the thickness of the required deposit, together with

the length of the rack, determined the necessary length of the plating tank. This, in turn, proportionately controlled the sizes of all tanks in the cycle, especially the cleaner tank or tanks.

At this stage other questions arose: Was it advisable to clean electrolytically, or should the assemblies first be soak cleaned? If electrolytically cleaned, should it be anodic or cathodic? What acid should be used prior to plating?

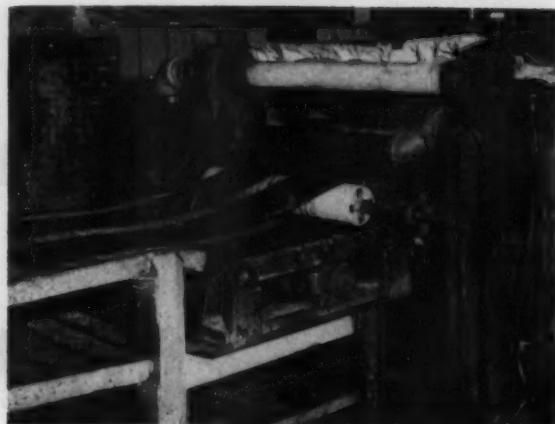
Some rather unexpected results were obtained from experimenting with pickle baths. At first, it was thought that hydrochloric acid would lessen the danger of disturbing the balance of ratio in the chrome bath. However, it was found that while this eliminated one danger, it presented another: The undesirable introduction of chlorides in the bath. The use of many acids for this purpose was investigated. It was finally found that best results were achieved with a solution of approximately 1.0 pet sulfuric acid and 0.1 pet muriatic acid.

Preparation of the parts for assembly and plating also presented certain difficulties. When chrome plating on stainless steel is attempted, the first step is determining what grade, or type, of stock is to be plated. There are more than a dozen standard grades and many more special

Straight line mass production techniques at Briggs make possible production of 3000 complex welded and chrome plated stainless steel assemblies per day. Features include polishing prior to forming and the world's largest automatic machine for chrome plating stainless.



1 Belt polishing prior to forming.



2 Applying water soluble compound.

Chrome Plating-Stainless

Continued

types, each presenting an individual problem in finishing. The common grades are classified as (1) martensitic, or hardenable chromium grades, (2) ferritic, or non-heat treatable chromium grades, and (3) austenitic, or non-heat treatable chromium-nickel grades.

Briggs was dealing with the latter, austenitic grade. The same equipment used for grinding, polishing, and buffing ordinary steel may be utilized for stainless steel. Generally, a speed of 6000 to 8000 sfpm is recommended for grinding and polishing, and a speed of approximately 10,000 sfpm for buffing.

Stainless steels are easily overheated during grinding, polishing or buffing because of their low thermal conductivity and high abrasion resistance. Too much pressure on the wheel will effect distortion of the part, and may cause galling or scoring. For grinding or polishing, it is advocated that only fused aluminum oxide abrasive grain or silicon carbide grain be used. For a mirror finish, only stainless steel coloring



3 Sheets move to the stamping department.

rouge (green chromic oxide or unfused aluminum oxide) should be employed.

In the preparation of No. 3 grade stainless steel for plating, it is most difficult to polish out pickle or rolling scale after a part was formed. Realizing this problem, the company set up to polish the sheet before forming as shown in 1. In this operation, sheets are passed under a series of abrasive belts until the desired finish is achieved.

From this polishing operation, the sheets are

6 Removing parts from dryer.



7 Mirror finish is produced with automatic buffing machines.



automatically moved through a washing machine to be washed, rinsed and dried. They next pass through a roller coater, shown in 2, where they are coated with a water soluble coating for finish protection. Following the roller coating, the sheets go through a drying oven, after which they are ready for the stamping department.

Stamping operations are illustrated in 3 and 4. From the stamping department the parts move on to the color buffing department, where they first pass through another washing process.

Equipment used for the plating operation is a straight line fully automatic plating machine with rack return conveyer overhead. The machine, engineered and built by The Udylite Corp., Detroit, is probably the largest of its type in the world for plating chromium on stainless steel. The unit is 164 ft long, 18 ft wide and 19 ft high. Carrier bars weigh 750 lb each, and are capable of carrying three plating racks weighing 460 lb each. Power is furnished by three 12-v generators, which can deliver 30,000 amp to the chrome plating tank. It is also equipped with one 6-v



4 Compounds prevents die marks from stamping operation.



5 Entry end of the washing and drying equipment.

Here the water soluble coating is removed and the parts are thoroughly dried before color buffing. Parts are shown entering and leaving washing and drying equipment, in 5 and 6, after which they are color buffed to a mirror finish on return-type fully automatic buffing machines. Buffing operations are shown in 7.

From the buffing department, the parts move by conveyer to the final assembly department. From the assembly line, 8, parts are placed on a conveyer to the chrome plating department.

generator delivering 3000 amp to the cleaner tank. The machine will produce 1500 sq ft of plated work per hr.

Experience has taught that it is advisable to soak-clean parts to be plated before immersing in the electrolytic cleaner. Parts are cleaned anodically in this operation. The solution now used in the soaking process consists of 4 oz per gal Wyandotte MK emulsion and 4 oz per gal tetrasodium pyrophosphate. The solution in the anodic cleaning operation is 3 oz per gal

g After assembly, parts are put on conveyer to plating department.

h Loading racks at start of plating cycle.

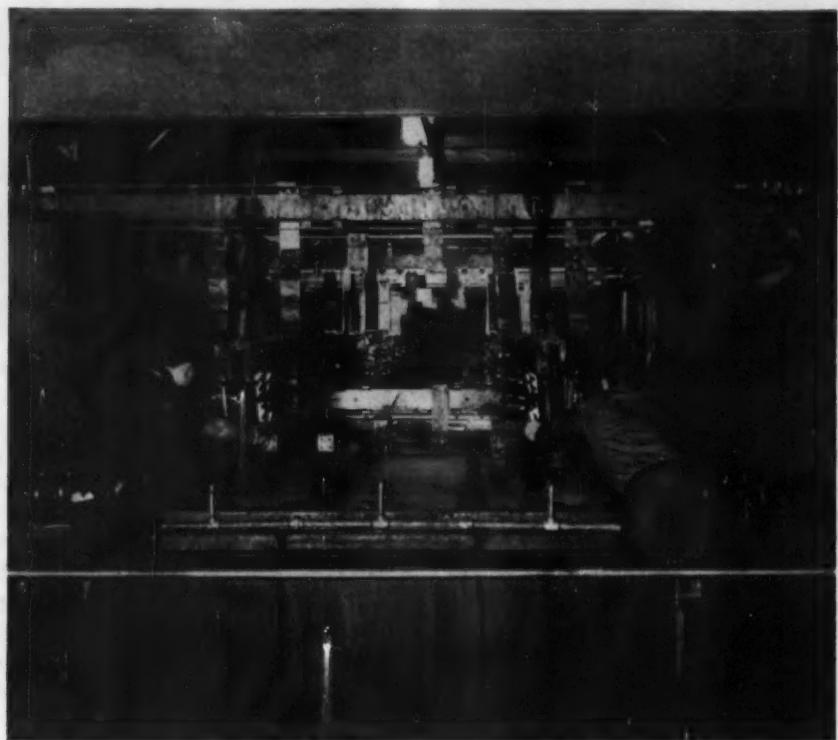


Wyandotte BN electrocleaner, used at a current density of 5 amp per sq ft for a period of 2½ min.

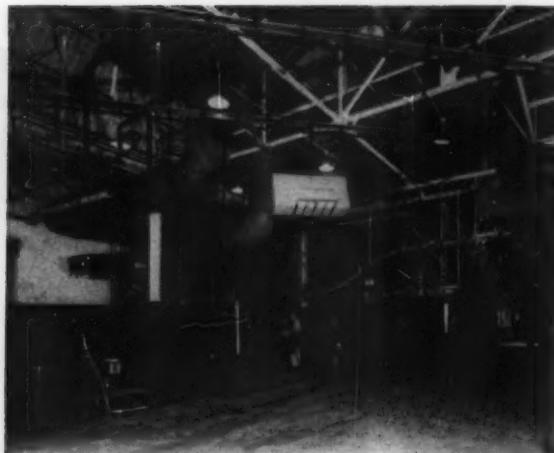
After cleaning in both soak and electrolytic cleaners, the assemblies are thoroughly rinsed in a high pressure spray rinse to insure removal of all traces of cleaner solution. They now move into an acid dip solution consisting of 1.57 pct sulfuric acid and 0.15 pct by vol muriatic acid and are submerged for 45 sec. Next, the parts move through a soak rinse and then a high power

spray rinse prior to entering the chrome plating tank.

The parts are moved through the chrome plating tank for an interval of 4 min, which gives the required amount of plate. The chrome solution used in this operation consists of 42 oz per gal CrO₃ and 0.50 oz per gal H₂SO₄ operated at a temperature of 120°F. From the chrome plating tank, work moves into a rinse tank where the dragout is salvaged for use as make-up in the plating tank. The parts are then thoroughly rinsed by a soak rinse, a spray rinse and finally a hot rinse, before moving to the unloading station. Here the assemblies are removed, but the racks remain on the machine as they are too heavy to take out. The racks are then car-



10 Loaded racks moving through plating machine.



11 The loading end of the huge automatic plating machine.

ried overhead back to the loading station to be reloaded for the start of another cycle, as shown in 9. The work may be seen moving through the plating machine in 10, while 11 shows an overall view of the loading end of the unit.

There are certain points to be remembered when engaged in chromium plating all types of stainless steel. Unless all trace of pickle matter is removed in the polishing operation, work will come out of plating tanks cloudy or gray. A properly cleaned stainless steel surface rapidly becomes passive in air and in many other oxidizing environments. Therefore, it is important that work be plated as soon after color buffing as possible. If work is stored more than 20 hr after color buffing, considerable difficulty is experienced in attempting to plate it.



FIG. 1—THE FINISHED MOCKUP of Kaiser-Fraser's new *Henry J.* car looks almost real when fitted with tires, window glass, bumpers and the rest of its accessories and trim.

PLASTICS

Speed Auto Body Production

Kaiser-Fraser eliminates wooden mockups, uses cast plastic models in new technique for making drawings and body dies from designer's clay model of a new car. Simplified procedure increases accuracy and requires less than half the time formerly required to complete tools and dies.



By GEORGE ELWERS
Machinery Editor,
THE IRON AGE

THE process of translating a hand-sculptured clay model of a new automobile into dimensionally accurate drawings and models for tool and die makers is involved and time-consuming, in contrast to most operations in the most mechanization-conscious of all industries. Improvements have been applied from time to time by different manufacturers, but the overall procedure has remained substantially unchanged.

Recently, Kaiser-Fraser engineers made a frontal attack on the whole problem. Instead of imposing improved methods piecemeal on the standard sequence of operations, K-F has gathered together some of the improved methods which have been applied or at least tried by others, added some important innovations of their own, and integrated them into a substantially

new procedure which has proven very successful.

A new car design begins with general specifications on such matters as size and appearance, and progresses through designer's renderings to a final full-size clay model of the new car. The outlines thus fixed must then be translated into models for Kellering, and detailed design drawings for parts, tools and dies.

The means by which this is accomplished is generally the same throughout the industry, differing only in details among different manufacturers. The procedure formerly used by Kaiser-Fraser is typical. From the clay model, templates are taken and used to transfer the surface lines to a rough draft on paper. Then these lines are refined, or trued. Since the clay model is made by hand, and not dimensionally stable, consider-



FIG. 2—THE BEGINNING of Kaiser-Fraser's tool and diemaking procedure. Body contours are reproduced in plastic sections cast in molds made from the clay model.

able refining is required. Edges must be straightened, curves smoothed, and in general, dimensional accuracy, regularity and consistency are imported to the lines. Particularly, opposite sides of the car must be made mirror images of each other.

From the trued lines of the rough draft, new templates and detail drawings are made and used to guide construction of a full-size wooden model of the car. This model, after final refining of lines is done on its surface, becomes the master mockup of the car. From its surface new templates are made. These are used to lay out the master draft, on metal. From this draft mahogany die models are made for casting the plasters which are used in Kellering the surface draw dies.

The involved procedure—(1) transferring surface lines from a model to templates to paper; (2) back by means of new templates to a new model; (3) then by means of new templates to a master draft; and (4) to final wooden models—is not conducive to great accuracy. Therefore, during the work on detail structural and tool drawings, and tool and die manufacture, there must be constant cross-checking of dimensions to detect and correct inaccuracies so that the final manufactured body sections and interior structure will match and fit.

Kaiser-Fraser's method of simplifying this procedure and reducing the inaccuracy is centered mainly around the use of cast plastic to form a master model. This idea is not entirely new, but use of plastic models has been limited in success primarily due to warping problems. In conjunction with Kish Plastics, of Lansing, K-F has developed casting techniques which eliminate warping problems. Plaster molds made from the clay model are used for casting the plastic. Over a lightweight honeycomb core, a urea-formaldehyde plastic is poured, then cured in an oven. During curing, warping occurs, but the cured model is dimensionally stable. It is then returned to the molds and additional plastic poured in, filling out the mold in a thin coating

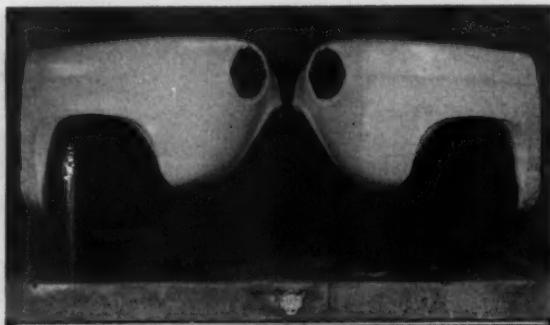


FIG. 3—PLASTIC MODELS of the Henry J.'s front fenders.



FIG. 4—THE MOCKUP of the Henry J., made up of the refined plastic body sections fitted together.

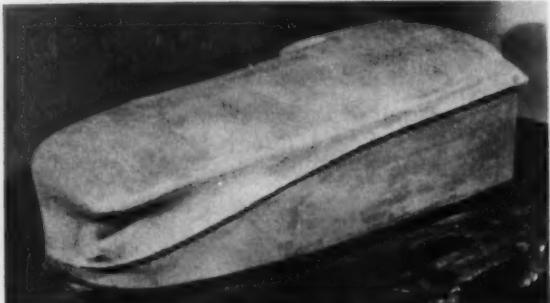


FIG. 5—A MALE KELLERING MODEL of a Henry J. body section, cast from plaster molds made from a plastic body panel model.

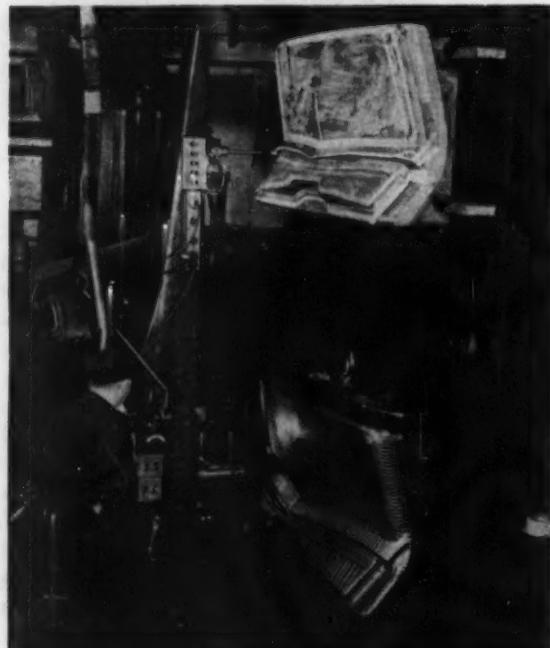


FIG. 6—KELLERING one of the surface draw dies for a Henry J. body panel.



FIG. 7—A FINISHED STEEL DIE for one of the Henry J.'s rear fenders.

on the surface of the rough casting. This coating retains accurately the mold contours and does not warp, because of the backing of the cured rough casting. Refining of lines is now done directly on the surface of the plastic molds, cutting away plastic where the surface is too high, trowelling on more plastic material where it is too low. One side of the car is trued in this manner; then templates are made, reversed, and used in truing the molds for the opposite side.

The making of this, the only set of templates required in the entire procedure, is simplified through the use of plastic edges. The templates are cut to roughly approximate the model contours, and positioned with a clearance between the template edges and the model surface. This clearance is then filled with plastic, which sets

up hard giving the template an accurately contoured plastic edge.

These templates are also used to lay out a master body draft on metal, from which detail drawings of body sections, flange and mating details, and interior structure, can be made. The plastic master models of each panel are used for casting plasters from which the plaster models are made for the die shops to use in Kellering the surface draw dies.

The elimination of the wooden models is important because they are costly and require a long time to make, and because the plastic is much easier to work than the mahogany commonly used for the wooden models. This makes truing of lines and incorporation of design changes much easier.

The time savings have been very substantial. A recent K-F design required 27 weeks from approval of the clay model to completion of die work. To reach the same point using the old procedure would have required 48 weeks. And K-F engineers believe that additional gains can be made through more refinement of lines on the original clay models.

Incidental to the main program, plastics have found other uses in connection with body manufacture. K-F now makes extensive use of plastic models (made from the plastic master) in checking fixtures, replacing the steel fixtures formerly used for this purpose. And it has been found that the plastic is hard enough so that metal can be hammered over plastic models for the handmade versions of a new design which are made before the car goes into production. Wooden hammer forms were formerly constructed for this purpose.

Plastic Coated Steel Resists Corrosion

TESTS have proven the effectiveness of vinyl plastic as a protective coating for steel exposed to underwater corrosion. Its industrial use has developed to the point where it was recently specified for use on one of the nation's largest steel construction jobs—the Boston Mystic pier project.

These tests were a deciding factor in the selection of vinyl plastic for the pier project. They were conducted by the Arundel Barge Co. of Baltimore, and the Corrosite Corp. of New York, manufacturer of the vinyl plastic product. Results showed that the coating is an almost perfect protection against water corrosion.

A steel plate coated with Corrosite vinyl plastic was immersed in Baltimore harbor and left there for 6 months. This water has a high chemical content because of the numerous industrial plants that line its waterfront. Prior to immersion, a scratch was made along the center of the plate.

When the plate was withdrawn, the scratch showed corrosion to a depth of nearly an eighth of an inch. The rest of the plate showed no signs of failure.

Next, several barges of the Arundel Co. were coated with Corrosite. In this case, too, inspection after a period of several months revealed no signs of deterioration.

Tests Prove Worth of

By A. S. JAMESON, Supervisor, Metallurgical Research Labs.,

J. A. HALGREN, Chief Research Metallurgist,

and S. A. SHERIDAN, Research Metallurgist, International Harvester Co., Chicago

IT is generally agreed that a bolt should possess some ability to permanently deform without rupture. It is customary to tighten a bolt in assembly with load close to or exceeding its yield strength, and so it is essential that there should be some gap between its yield strength and its tensile strength. Actually, between the yield strength and the ultimate tensile strength the bolt undergoes an elongation which can be called, for the purpose of discussion, "cylindrical elongation."

Cylindrical elongation implies a uniform reduction of area over the gage length. After the ultimate tensile strength has been reached, the elongation is no longer uniform but is accompanied by a local reduction of area. The use of the 115 pct minimum ratio of tensile strength to yield strength coincides with the cylindrical elongation part of the load-elongation curve, and is a means of assuring a minimum of ductility or plasticity. The effect of the reheating temperature on the tensile-yield ratio is shown in Fig. 6.

Another method of determining ductility or plasticity is concerned with the total elongation, which would include the cylindrical and the localized elongation zones. Still another method of ensuring sufficient ductility or plasticity, as recommended by the SAE, is that of using a 10° wedge under the head of the bolt during tensile testing and specifying that the bolt shall fail in the threaded section and not in the head, and shall meet the minimum tensile requirements as well.

The question as to how much plasticity is required in a bolt remains unsettled. Many have questioned the adequacy of the 115 pct minimum ratio of tensile to yield strength. Others have suggested a 1/32-in. minimum elongation before failure over a gage length of three unengaged threads plus the bolt body. This requirement would naturally be affected by the bolt diameter, and the number of threads per inch.

Elongation values at the various reheating temperatures are shown in Fig. 7. Elongation was taken from the autographic chart as permitted by the redesigned extensometer which records the elongation to the failure of the bolt. Values are affected by the number of unengaged

threads. The 6½ unengaged threads corresponds to a gage length of ½ in., or the diameter of the bolt.

There is a general correlation of the tensile-yield ratio with the elongation values. The low tensile-yield ratio coincides with the low elongation values which occur in a reheating range of from 400° to 900°F. Over 900°F, both the elongation and the spread between the yield and tensile strength increase. They differ considerably in the green condition. The use of 3 or 6½ engaged threads did not have any effect on the tensile-yield ratio.

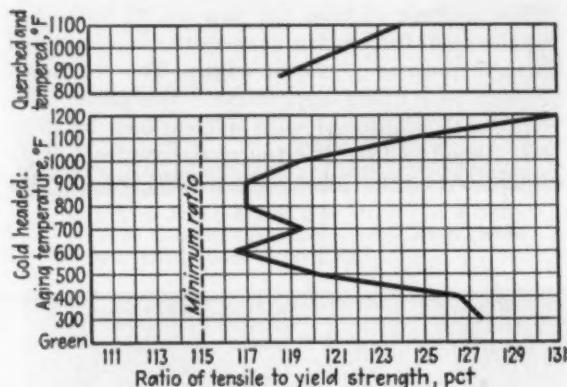


FIG. 6—Tensile-yield ratio for 1/2 in.-13 x 1 1/2 in. 0.40 pct C steel bolts, cold formed and reheated to temperatures shown. Similar data for quenched and tempered bolts of the same material are shown for comparison.

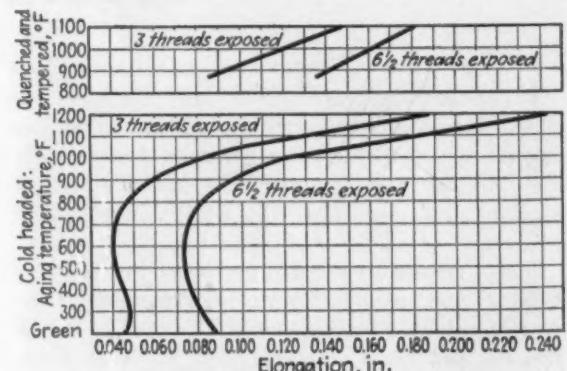


FIG. 7—Elongation of cold formed and reheated 0.40 pct C bolts, as compared to elongation of the quenched and tempered type.

Cold Extruded Bolts

Cold headed double extruded medium carbon cap screws demonstrate higher fatigue strength than their quenched and tempered counterpart. Tests conducted at International Harvester, described in this second part of a two-part article, show that these less expensive bolts merit serious consideration in designs where lower tensiles and ductility are acceptable.

A number of these bolts were subjected to the wedge test as specified in the SAE recommended practice. There were no failures in the junction of the head and shank either on the cold headed bolts or on the quenched and tempered bolts. More work is projected on the relationship of axial and non-axial loading.

The number of exposed or unengaged threads used in tensile testing (and in twist, bending and fatigue testing as well) has a considerable bearing on the test results to the extent that they influence the distribution of stress. They also affect the correlation of tensile strength to hardness.

Fig. 8 shows the effect of the number of unengaged threads on the yield, tensile, and elongation of $\frac{1}{2}$ in.-13 x $1\frac{3}{4}$ in. hexagon head cold worked bolts. The recorded tensile strength falls from 0 to 6 threads and then remains constant up to 11 threads exposed. The yield strength becomes almost constant at two threads exposed but continues to fall slightly up to 11 threads, the testing limit. Elongation per bolt continually rises as the exposed threads increase up to 11.

Hardness is recorded in the SAE recommended practice as a subordinate property. However, where other types of testing are not available and when the bolt shape is such that tensile testing may not be employed, it becomes a mandatory requirement.

Hardness is in reality a basic property and, therefore, one which can be well used to control the manufacture of cold worked bolts. Hardness is sensitive to the amount of cold work and the degree of aging and in turn can be correlated with yield and tensile strength and ductility. Recorded yield and tensile strength and ductility are dependent as previously shown on the number of threads exposed and on the method of extensometer attachment, but hardness in this sense is independent of both.

Certain tests indicative of ductility have already been mentioned under tensile testing: the tensile-yield ratio, total elongation to rupture and wedge testing. A crude method of appraising the toughness of bolts used in the past consisted of placing the threaded portion in a vise with some threads exposed and striking the head

of the bolt with a hammer. Consideration was given to both the number of blows and the degree of bending which took place before cracks appeared in the root of the threads. Some data on testing bolts in this manner are shown in Fig. 9. These bolts were clamped in a vise with four threads exposed and struck on the head with a 3-lb hammer. Cold-worked, aged, and heat treated conditions are shown in comparison.

Another mode of testing toughness which was used in the past was a twist test. The procedure typically read as follows: "Bolts shall be gripped in a vise at the top of the thread (on full threaded bolts grip at one diameter below the

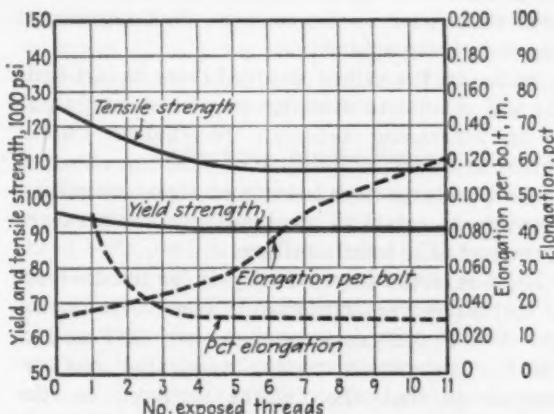


FIG. 8—Effect of the number of exposed threads on the tensile testing of $\frac{1}{2}$ in.-13 cold headed bolts (green).

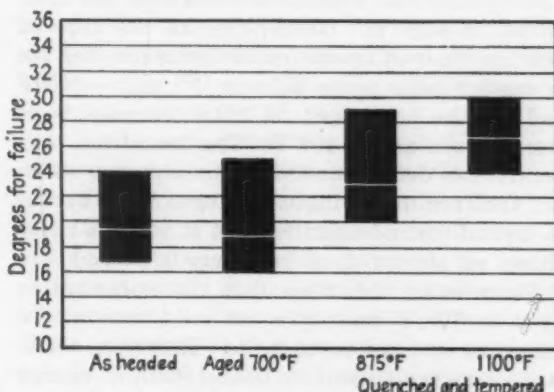


FIG. 9—Graphic representation of several bend tests on $\frac{1}{2}$ in.-13 x $1\frac{3}{4}$ in. hexagon head 0.40 pct C bolts; break in the line indicates the average.

top of the thread) and a wrench applied to the head with the upper two-thirds held in the jaws. The head shall neither fracture nor break off before the bolt breaks at the root of the thread." Some tests were performed in this manner, but using a torsion testing machine equipped with a load-twist autograph. Gripping was in a thread-vise, at the runout, leaving only the partially formed thread extending. A graphical representation of the results is shown in Fig. 10. Cold-worked, aged, and heat treated conditions are again shown in comparison. For effects of the number of exposed threads see Fig. 11.

Greater Plasticity Shown

These bending and twisting tests show the quenched and tempered bolts to have greater plasticity than cold worked and aged bolts. However, it should be borne in mind that a minimum ductility requirement with respect to bolt service has not been agreed upon, unless the performance of a bolt under 10° wedge loading is taken as a criterion. In the latter case, cold worked and aged bolts meet the ductility requirement and the fact that the quenched and tempered bolts have greater elongation or a greater ability to be bent or twisted is not necessarily a significant factor in their application.

Although the values obtained from impact testing are related to ductility measurements, there is an increasing tendency to analyze impact values in terms of the type of fracture obtained at temperatures both below and above room temperature to establish the transition temperature from ductile to brittle failure.

Bolts referred to previously under tensile tests as series one were subjected to transverse impact at -100°F , 0°F , room temperature, 75°F and at 212°F . The impact testing apparatus was arranged so that the failure occurred in the threaded section of the bolt. These were $\frac{1}{2}$ in.-13 x $1\frac{1}{2}$ in. hexagon head bolts. The blow was struck by a 120 ft-lb hammer using a standard Charpy machine. Results of these tests are illustrated in Fig. 12. Observation of the type of fracture showed transition temperatures for the as-headed bolts to be between 0° and -100°F and for the bolts aged at 700°F between room temperature and -100°F . The transition temperature is defined as the temperature at which the fracture under impact changes from fibrous to crystalline and also the point at which a curve shows an abrupt drop in energy absorbed.

There is an indication that the as-headed or aged at 700°F bolts are not as tough as the quenched and tempered bolts. However, correlation between transition temperature or energy absorbed values and engineering service has not been definitely established. It will be noted that the impact tests correlate in a general way with

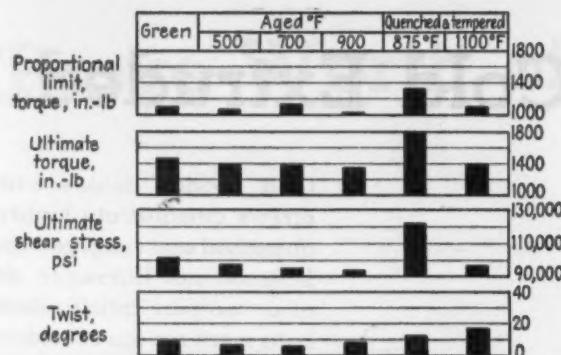


FIG. 10—Results of torsion tests on the hexagon head bolts in various conditions of reheating and heat treatment.

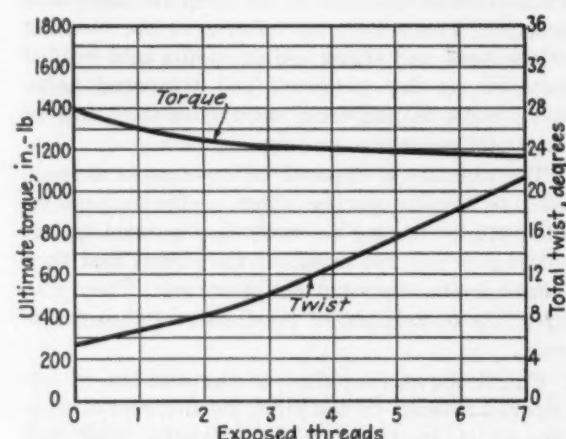


FIG. 11—Effect of the number of exposed threads on the torsion testing of $\frac{1}{2}$ in.-13 bolts, cold headed and aged at 700°F .

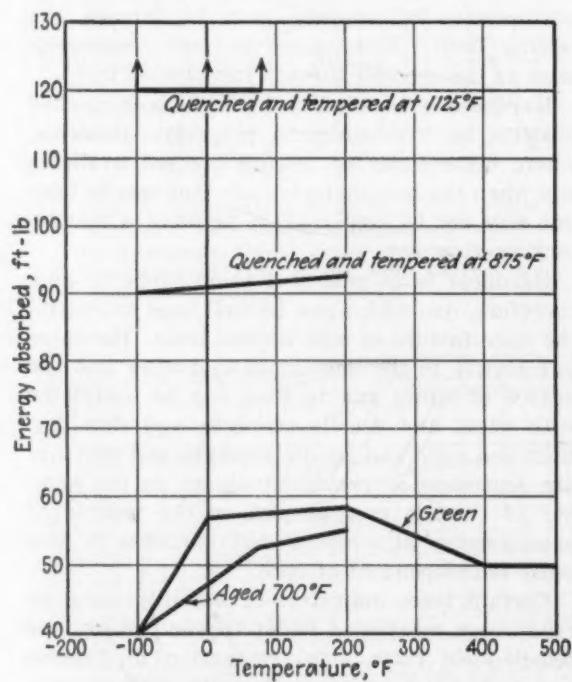


FIG. 12—Results of transverse impact tests on $\frac{1}{2}$ in.-13 x $1\frac{1}{2}$ in. hexagon head bolts. Testing apparatus was arranged so that failure occurred in the threaded section.

TABLE III

ENDURANCE LIMITS OF HEXAGON HEAD BOLTS

Condition	1/2 in.-13 x 1 3/4 in. Bolts		1/2 in.-13 x 1 1/2 in. Bolts	
	Not Machined Under Head	Machined Under Head	Not Machined Under Head	Machined Under Head
Cold worked.....	23,000	19,000	27,000	
Cold worked and aged at 700°F.....	13,000	18,000	22,000	
Quenched and tempered at 875°F.....	9,000	10,000	10,000	
Quenched and tempered at 1100°F.....	10,000	.....	18,000	

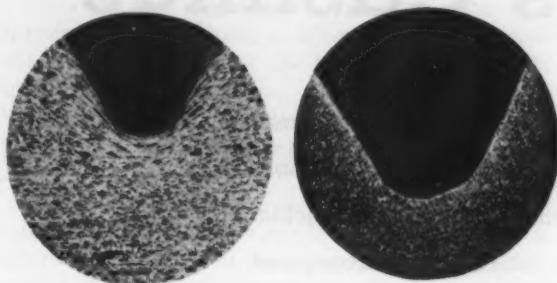


FIG. 13—Photomicrograph of root of thread of, left, cold worked and, right, quenched and tempered 1/2 in.-13 hex head bolts. Cold worked bolts show cold worked ferrite on the immediate surface of the notch, while the quenched and tempered specimen surface consists of soft, unworked ferrite.

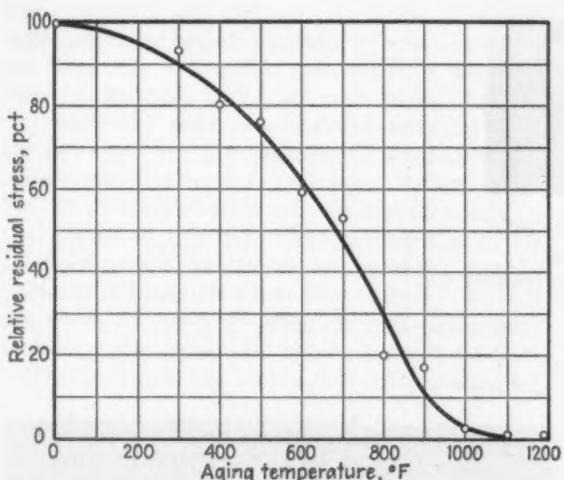


FIG. 14—Residual stress in cold headed and reheated 1/2 in.-13 x 1 3/4 in. bolts. Residual stress in quenched and tempered bolts was found to be negligible.

TABLE IV

ENDURANCE LIMITS WITH 50,000 PSI TENSION PRE-STRESS*

Condition	Endurance Limit, psi
Cold worked.....	14,000
Cold worked and aged at 700°F.....	9,500
Quenched and tempered at 875°F (theoretical).....	6,500
Quenched and tempered at 1100°F.....	8,500

* 1/2 in.-13 x 1 1/2 in. hexagon head bolts.

the ductility tests as the cold headed bolts have a higher transition temperature.

SN curves were determined for 1/2 in.-13 bolts in both the 1 1/2 in. and 1 3/4 in. lengths. It was assumed in the tests that 10,000,000 cycles was the endurance limit. The tests were made on a Sonntag SF-20 U fatigue machine under tension loading from 0 to maximum.

In the testing of bolts as manufactured, it was found that the results were somewhat erratic. In order to obtain true tension loading with the under side of the head at right angles to the axis of the bolt the washer face of the bolt was machined. Irregularities with respect to this angle would cause bending as well as tension stress to be applied to the bolt. Results are in Table III.

These tests show that the cold worked and aged bolts are superior to the quenched and tempered bolts. Perhaps this superiority is due to the conditions existing at the root of the thread. In cold worked bolts the notch on the immediate surface consists of cold worked ferrite whereas in the other case the notch on the immediate surface consists of soft unworked ferrite, see Fig. 13.

Endurance Limits Raised

Endurance tests were also made starting with a pre-stress on the 1/2 in.-13 x 1 3/4 in. hexagon head bolts used in previous tests. The tests were performed in the same apparatus previously described. Table IV shows more details.

The superior endurance limits of the cold worked bolts might also be attributed to favorable residual stress. The residual stress was qualitatively determined in 1/2 in.-13 x 1 3/4 in. bolts, as-headed and reheated from 300° to 1200°F. The result of these measurements is shown in Fig. 14. Residual stress in quenched and tempered bolts was negligible. These data and the method of determining the residual stress were described by Halgren, Sheridan and Goodman in THE IRON AGE, Mar. 17, 1949.

It would appear that a cold worked or a cold worked and aged medium carbon steel bolt in sizes from 1/4 in. to 5/8 in. and in lengths up to and including 6 in. SAE grade 3 has a place in engineering design on the basis of its higher fatigue strength, though admitting its limitation with respect to ultimate tensile strength and ductility as compared to a quenched and tempered bolt SAE grade 5. This is true only of bolts manufactured in the manner discussed in this article: Thread rolling or cut-threading as a final operation can create a new set of conditions.

Tung Oil Seals Porous Castings

A wide variety of castings are being impregnated in large quantities with tung oil to seal leaks due to micro shrinkage and micro gas porosity. Often 100 pct of production is impregnated, with results so reliable that subsequent pressure testing is sometimes eliminated.



By **GEORGE J. DULL**
Manager,
Approved Casting Impregnating Co.,
Detroit

WHERE properly applied, the impregnation of ferrous and nonferrous castings with tung oil offers an economical and practical method of suppressing leaks due to micro shrinkage and micro gas porosity. Large holes cannot be reliably sealed with tung oil.

Impregnation may be applied: (a) To 100 pct of the castings, often eliminating individual pressure testing; (b) to only those castings which pressure tests have proven to be too porous for satisfactory service.

Porosity is always a potential foundry problem. Porous castings may result from a number of causes, including: (1) Improper design; (2) improper feeding; (3) sand conditions; (4) pouring conditions; (5) shrinkage characteristics of the metal; and (6) gas content of the metal and other factors.

A casting that is slightly porous may be entirely satisfactory for the intended service from the standpoint of physical properties. However,

it may still be inadequate to resist the hydraulic or pneumatic pressures encountered. Then it becomes essential to find an economical method to make a physically adequate casting satisfactory for service at the least possible cost. Impregnation under controlled conditions with tung oil is finding increased use under these circumstances.

Sealers are not new to the foundry industry. Pigmented enamels, varnishes and drying oils have been used for a number of years as surface coatings for sealing porous castings. However, for many modern applications, surface treatment alone is not satisfactory since such treatment does not fill the porous areas nor does the filler material become an integral part of the casting.

Sodium silicate (water glass) has been used successfully as a sealer. However, this sealer must be used with caution since it is alkaline and consequently reacts with metals such as zinc, aluminum and magnesium. Furthermore,

since sodium silicate is somewhat abrasive, extreme care must always be taken in cleaning a casting so as not to impair bearing surfaces.

One of the most serious disadvantages of water glass is the fact that it contains over 50 pct water. As the water leaves the solution, a gel forms, making it difficult to dehydrate the impregnated casting completely. The castings may pass a pressure test but on aging, residual moisture dries out, causing leakage to reoccur. (THE IRON AGE, Jan. 10, 1946, p. 63.)

Impregnation by forcing tung oil into and throughout the casting is often an adequate and economical solution for the leaker problem. This type of impregnation was well recognized during World War II. However, its use was limited by the War Production Board because of unavailability of tung oil.

The impregnating process is described in detail in Aeronautical Specifications AMS-2560A issued June 13, 1940, and revised Mar. 1, 1942, by the Society of Automotive Engineers. The impregnation method used by the Approved Casting Impregnating Co. is in accordance with specification AN-I-36.

Impregnating Methods

The correction of certain porous conditions in castings by impregnation with tung oil can be carried out under carefully controlled conditions using vacuum and pressure methods. The castings are then baked, causing polymerization of the tung oil. When this treatment is used, the tung oil becomes a definite part of the casting. Impregnation does not improve physical properties except in thin magnesium sections where compressive strength is improved. Among a long list of products being treated commercially by the Approved Casting Impregnating Co. of Detroit are aluminum diecastings, washing machine parts, fuel injection parts for aircraft, gas heating units, oil heating units, aircraft parts, automobile parts, automatic transmission parts, etc.

The company has impregnated approximately

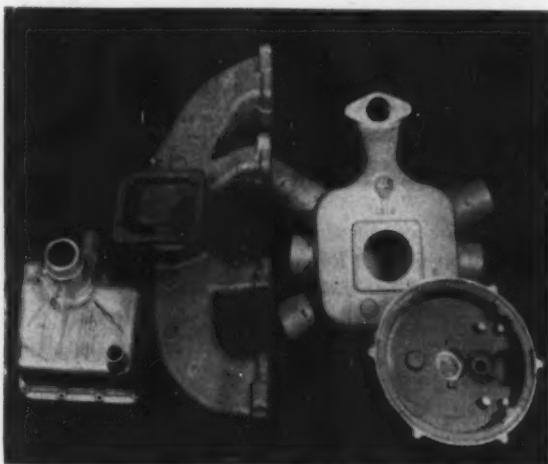


FIG. 1—Indicative of the wide variety of castings being impregnated by Approved Casting Impregnating Co. At left is an Al diecasting, next a cast iron manifold, next a Mg aircraft intake manifold, and a bronze pump casting.

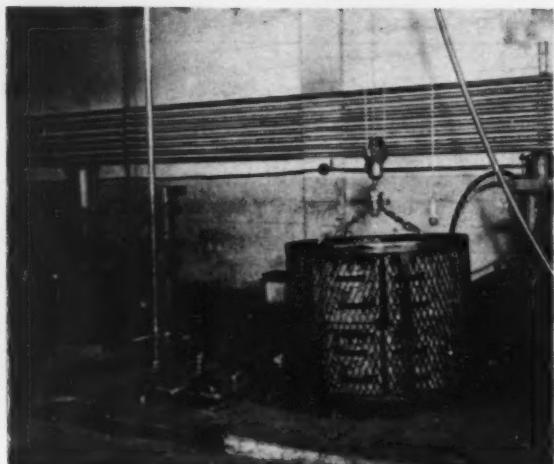


FIG. 2—A basket of malleable iron automotive transmission case castings ready for lowering into the impregnation autoclave. Impregnation helped solve a serious leakage problem on a well-known make of automatic transmission.

9½ million lb of castings. Castings have been impregnated for service at temperatures as high as 1000°F and pressures up to 3000 psi. Months of operating experience have shown that the impregnation is fully effective even under such severe conditions.

For some types of castings, 100 pct of production is impregnated. The sealing effectiveness has proven so reliable that on some of these parts, which were formerly pressure tested by the vendor before shipment and by the purchaser prior to assembly, they now go through production without any pressure test other than that normally applied to the finished product.

Cost Is Low

The cost of impregnating castings varies with the type of casting, the quantities involved and other factors. Cast iron cylinder heads can be impregnated for about ½¢ per lb minimum when furnished in comparatively large quantities. An aluminum diecasting weighing 1 lb 10 oz is being impregnated for 0.027¢ per lb. The specific price will naturally vary with each type and size.

The successful sealing of castings by impregnating may enable a product engineer to design more intricate parts where previously he may have been reluctant to do so because of the possibility that porous conditions may develop. Successful impregnation also makes it possible to decrease wall thicknesses in some applications and this results in lighter castings. A powdered metal parts manufacturer is turning to impregnating powdered metal parts to withstand gas or oil pressures of 100 psi. The parts were tested at pressures up to 5000 psi.

The impregnation procedure is simple. The first operation is to prebake at 300°F for ½ hr. This removes water and gases from the castings. It also opens the porous areas somewhat. The castings are then placed in an autoclave. After closing the cover, air is evacuated from the autoclave using a vacuum of 27 in. minimum. The

vacuum is held for $\frac{1}{2}$ hr. The next step is to pump in the solution from the other half of the dual autoclave setup. This insures that a high vacuum will be held until the castings are completely covered with tung oil.

After the vacuum is released, air pressure of 90 to 100 psi is applied and held for 30 min. The next step is to release the pressure and open the cover. The solution is then pumped back for the next operation after which the castings are removed and rinsed thoroughly in a thinner or solvent.

Then the castings are dried in air for 2 hr or more at room temperature. Finally the castings are placed in an oven and baked for 2 hr at 350°F. This baking operation causes polymerization of the tung oil which then becomes, in effect, an integral part of the casting.

The thermal coefficient of expansion of polymerized tung oil is approximately 10.67 times that of aluminum and 3.55 times the linear expansion of the most commonly used aluminum alloys. In the accompanying table the cubical expansion coefficient of tung oil is approximately three times the linear expansion.

Numerous laboratory tests have been run to show the effectiveness of tung oil impregnation in correcting pressure leaks in castings.

The hydraulic cylinders, bronze castings, were verified as positive leakers. These castings were required to withstand pressures up to 3000 psi. Before impregnation they were tested with a hydraulic pump. As the pump forced the oil into the castings, the pressure failed to go above 1500 psi, due to a porous condition. As soon as the hydraulic pump was stopped, the pressure gage dropped immediately. After subjecting these castings to tung oil impregnation, they were again tested for 3000 psi. No leaks were found in these parts.

TUNG OIL EXPANSION				
Temperature Range, °F	Aluminum Expansion Average, In.	Glass Expansion Average, In.	Tung Oil Expansion Average, In.	Expansion Ratio—Tung Oil to Aluminum
-40 to +72	0.0000369	0.00009	0.00009	1 to 2.43
72 to 212	0.0000369	0.00009	0.0004202	1 to 11.39
212 to 300	0.0000369	0.00009	0.0007216	1 to 19.55
300 to 450	0.0000369	0.00009	0.000354	1 to 9.60

Six oil control valve bodies were selected and tested to verify them as positive leakers. They were then subjected to tung oil impregnation. The castings were bolted to a vibrating table and vibrated at 1350 cycles per min at $\frac{1}{4}$ in. vertical and $\frac{1}{8}$ in. forward motion to a total of 1,215,000 cycles. Fifteen times during the test, at approximately 81,000-cycle intervals, the castings were removed and tested for leaks, then replaced on the table and the vibration continued. The entire test ended with no leaks having developed.

Twelve intake manifolds were selected and tested to verify them as positive leakers. They were then subjected to tung oil impregnation. The castings were air tested at 30 lb air pressure and dipped in water. No leaks were found. The castings were placed in a furnace and heated to 1000°F temperature. After cooling off in room temperature, the castings were again tested and there were no leakers.

Tung oil is a drying oil. On holding it for long periods of time at room temperature or on heating for a short time at 300°F, it polymerizes into a stiff jelly. In its natural form, tung oil is soluble in chloroform, ether, carbon disulfide and oil. The polymerized product is practically insoluble in the usual organic solvents. Inorganic solvents such as acetic acid or trisodium orthophosphate have a deleterious effect on the casting and cannot be employed. Tung oil cannot be removed by chemical reaction.

Electroplated Phosphorus Alloys Give Hard Coat

A COMMERCIAL method for producing electrodeposits of cobalt or nickel alloyed with 15 pct phosphorus has been developed by the National Bureau of Standards. These plating baths operate at a pH between 0.5 and 1.5, depending upon composition. Phosphorus alloys are more easily deposited than chromium and are quite hard, corrosion resistant and bright. It is believed that this method of plating will find applications which require a hard wear resistant surface or decorative finish.

Desired acidity in the cathode film of the bath is attained by buffering the solution. Phosphoric

acid is one of the best chemicals for this purpose. Baths are kept at a temperature above 160°F because at lower temperatures the cathode current efficiency is very low and the deposits have a tendency to be weak. Current densities run between 5 and 40 amp per square decimeter.

Hardness of these deposits varies from 350 to 720 Vickers and increases with phosphorus content. The alloy may be heat treated at 752°F for additional hardness. Deposit structures are of a columnar type which, when heat treated, developed a fine grain structure instead of the large crystals typical of pure nickel or cobalt.

New Books

"*Steeltown*," by Charles R. Walker. Here is presented a case study of what happens to a community when the closing down of its chief industry is threatened. The particular instance is Ellwood City, Pa. The study is made by the Institute of Human Relations, Yale University. The encouraging factor is the zeal with which all parties affected have collaborated in attempting to ease the social and economic readjustments. The job is not yet completed, and a second volume will be required to report on the final results. Readers of this first volume will look forward to the sequel with much interest. Harper & Brothers, 49 E. 33d Street, New York. \$4.50.

* * *

"*A Guide for Contracting of Construction and Related Engineering Services*." Issued by the U. S. Atomic Energy Commission, the booklet describes how AEC construction and architect engineer contracts are awarded, and describes the steps firms should take to be considered for those types of work where bids cannot be solicited by formal advertising. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 10¢.

* * *

"*Job Evaluation*," by J. A. Patton and R. S. Smith, Jr., is a practical guide to job evaluation methods, procedures and practices, covering in detail the four most generally accepted methods of job evaluation. Complete detail is directed to point rating, the most widely accepted method. An entire chapter is devoted to merit rating as a complement to a job evaluation program. Richard D. Irwin, Inc., 3201 S. Michigan Ave., Chicago 16. \$4.50. 338 p.

* * *

"*ESL Bibliography No. 4*," is a comprehensive list of 114 books and periodical articles published from 1937 to date, covering all aspects of the subject of pallets, including design and construction of different types, handling of various materials on pallets, savings achieved in materials handling, and details of present-day applications in individual plants in a large number of industries. Engineering Societies Library, 29 W. 39th St., New York 18. \$2.00.

* * *

"*Fundamentals in the Production and Design of Castings*," by C. T. Marek. This presentation of casting skills, techniques and practices is designed to assist the engineer in correlating casting design with economical casting production. Included are an overall view of the casting industry, description of basic molding processes, the theory of clay bond, a back-

ground in the principles of metallurgy, and other features. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. \$4.00. 383 p.

* * *

"*Master Chart of Welding Processes*." Thirty-seven welding processes in commercial use are listed in chart form and additional process charts compare these processes on the basis of similarities and differences. American Welding Society, 33 W. 39 St., New York 18. 35¢.

* * *

"*Stress and Strength of Manufactured Parts*," by C. Lipson, G. C. Noll, and L. S. Clock. Written for designers, engineers and metallurgists, the book provides specific data on the prevention and elimination of failures in manufactured parts and assemblies which may arise from defective design, defective metallurgy, production processes or other causes. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18. \$4.50. 259 p.

* * *

"*Welding Handbook—Third Edition*." The book contains 65 chapters covering the more than 30 welding and cutting practices in use by industry today, both for ferrous and nonferrous metals and alloys. Also included are individual chapters on cost estimating, welding metallurgy, physics of welding, a dictionary of welding terms, engineering tables, welding symbols, filler metal specifications, inspection, and many others. More than 300 tables useful for reference are included. American Welding Society, 33 W. 39th St., New York 18. \$12.00. 1650 p.

* * *

"*Hochofen-schlacke*" (*Blast Furnace Slag*), by Fritz Keil. Written with the usual German thoroughness, the book represents a comprehensive discussion of all types of slags. The differences between the properties of blast furnace slags and those of other slags are emphasized. Various sections include the production and uses of granulated slag, chunky slag and slag blocks. An extensive bibliography is also given. Verlag Stahleisen M.B.H., Dusseldorf, Germany. 32.50 German Marks. 346 p.

* * *

"*The United States and the Restoration of World Trade*," by W. A. Brown, Jr. The book traces the historical background of the ITO Charter and the General Agreement on Tariffs and Trade. It gives a detailed account of their negotiation, explains their provisions, and indicates the relationships between them. The relationship of both instruments to the UN and ERP are analyzed. Brookings Institution, 722 Jackson Place, N.W., Washington 6, D. C. \$5.00. 572 p.

18-8 STAINLESS NOW EASILY CLASSIFIED

The Douglas Aircraft precipitation-pickle process allows rapid and positive separation of stabilized and non-stabilized forms of type 18-8 stainless steel. Testing time is cut. More samples can be checked at one inspection.

By O. J. WINKLE, Materials Metallurgist,
Process Engineering Dept., Douglas Aircraft Co., Inc., El Segundo, Calif.

IT IS impossible to estimate accurately the losses incurred in manufacturing plants each year that can be attributed to the fabrication of parts from improperly classified stainless steel stocks. In raw materials and failure of equipment, these can be considerable.

Chemical analyses for the positive separation of stabilized and non-stabilized 18-8 stainless steel are time-consuming and expensive. The number of analyses that can be run is limited by the personnel and laboratory facilities available. Some of the tests for stabilized stainless require a 48-hr test period. Only a few samples can be run simultaneously.

A method was developed in the process engineering laboratory of Douglas Aircraft Co., El Segundo, Cal., to cut testing time and to increase the number of samples that could be checked at one inspection. This method has proven highly satisfactory for rapid classification of (1) sheet stock up to 0.250 in. thick and (2) tubing with corresponding wall thickness. It lends itself readily to plate and bar stock. However, these items require more time and the results are not as apparent.

Sheet or plate stock is sampled by cutting off a corner approximately 2 in. on a side. Tubing

and bar stock are sampled by cutting off a piece 1 to 3 in. long, depending upon the diameter of the material.

The first step in this process is to induce carbide precipitation. This is achieved by heating the metal to 1560°F and holding at heat for a minimum of 3 hr. Then the piece is furnace cooled to a maximum temperature of 1000°F. After the samples have reached a temperature below 1000°F, they can be water-cooled, air-cooled, or furnace-cooled without affecting the results. Any heat treating or laboratory furnace with automatic control is satisfactory.

Tests were run in a laboratory electric muffle type furnace having a heating chamber 14x7½x5 in. Fig. 1 shows the effects of heat treatment on types 302 and 347 stainless respectively. Both samples were heat treated at the same time and electrolytically etched in oxalic acid for one minute.

The second step is to pickle the heat treated specimen. This is done in a standard production nitropickle tank containing 15-18 pct nitric acid and ¾ pct hydrofluoric acid. Samples were allowed to remain in the pickling tank for 3 hr. The time varies with the concentration of the pickle solution and the thickness of the samples.

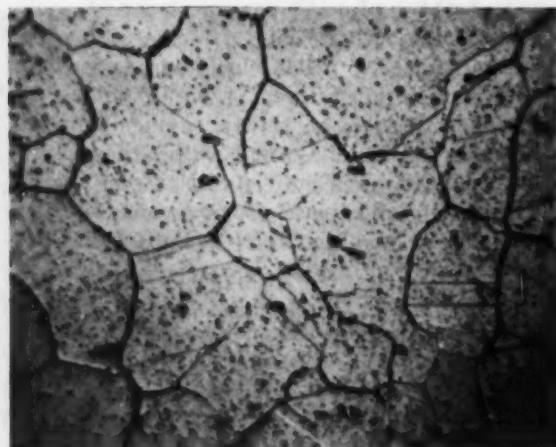


FIG. 1—The effects of heat treatment on type 302 and 347 steels are shown in these photomicrographs. Samples of type 302, left, and 347, right, were simultaneously heat treated and etched; 750X (approx.)

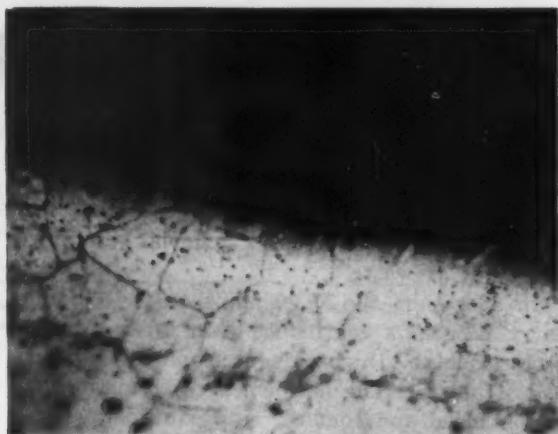
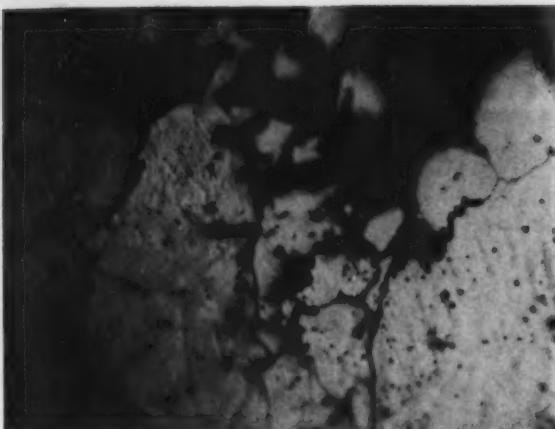


FIG. 2—The attack of the nitropickle on type 302 stainless, left, has completely detached some grains from the sample. Stabilized type 347, right, shows only a slight surface attack. Both samples shown under approx. 750X magnification.



FIG. 3—Stabilized stainless tubing and sheet samples, top, are only slightly changed after nitropickle. Non-stabilized samples, below, are rough surfaced, and have lost their stiffness and their metallic ring.

Next, the scale is washed free and the parts are dried.

The third and last step is the interpretation of results. Stabilized samples show very little change, if any. Non-stabilized samples exhibit some combination of the following properties: (1) rough, sandy surface, (2) loss of metallic ring, (3) soft and pliable, (4) decreased thickness, (5) partial to complete disintegration. Their micro structure usually reveals severe intergranular attack.

Fig. 2, left, shows the severe attack of the nitropickle on type 302 stainless. Some grains are completely detached from the sample. Fig. 2, right, shows the slight surface attack on type 347. Fig. 3 shows the surface appearance of mixed tubing and sheet samples. The non-stabilized samples are very rough and sandy, are soft and pliable, and have lost their metallic ring. There is no apparent change in the stabilized specimens. The non-stabilized samples lost 0.018-0.002 in. in the heat treating and pickling operations.

Over 5000 sheets of supposedly stabilized stainless stock have been checked by this method in

the last three years. Mixups of varying proportions have been detected. Sometimes only one sheet in a shipment has been wrong. The maximum found in one shipment was 48 out of 87 sheets that were not stabilized. This was a direct shipment from the mill and all sheets were mill marked type 347. The over-all percentage of rejections has been small. However, a 36x144-in. sheet may be cut into many small parts. When each of these small parts is an increment of a large assembly, troubles can pyramid to astounding proportions,

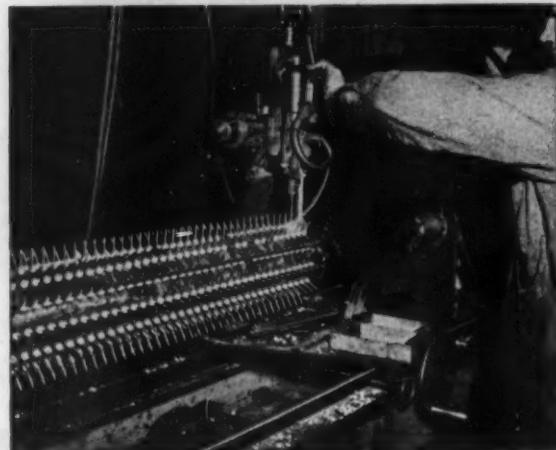
The carbide precipitation-nitropickle process has several advantages over other methods of segregation of stainless steels: (1) Producers and fabricators of stainless steels have furnaces and pickle tanks available, thereby eliminating the necessity of special equipment. (2) No additional expense of chemicals or laboratory facilities. (3) Man-hours required are very small. Over 600 samples were run in one day with an expenditure of two to three man-hours. (4) Does not require especially trained personnel. (5) Results are accurate and readily interpreted. (6) Large quantities of material can be checked without undue delay.

Stud Welding Tannery Comb Teeth

A SPECIAL stud welding setup makes possible the economical production of a new hair combing and drying machine for tannery use. The new machine provides a practical and efficient means of processing material heretofore discarded as waste.

In operation, the 30,000 pins on the 36 rolls carry hair in a continuous thin layer through each machine. Drying is accomplished by the use of hot air. The hair emerges from the machine, dried and combed, ready for baling and future use in floor pads, insulation, gun wads, and other similar products. Previous method of drying the hair has been to use a conventional screen belt, but results were often unsatisfactory because of matting and uneven drying.

The new machine, designed by Joy Smith, consulting mechanical engineer of San Francisco, utilizes a technique that end welds thousands of pins on the hairs carrying rolls without penetrating the working surface. Blank rolls measuring 4 ft x 5 $\frac{1}{4}$ in. in diam are chucked into the stud welding machine. The welding setup includes a Nelson hand operated stud welding gun and an indexing mechanism. After a pin has been welded to the roll, the operator advances the gun to the next position by turning a crank at the front of the machine. A pin and protective ferrule are then inserted into the gun, and the gun is lowered by a hand lever against



PINS ARE end-welded to the rolls at the rate of 71 per min. This special fixture incorporates a standard Nelson stud welding gun and an indexing mechanism. Nearly a thousand pins are welded to each of the 36 rolls in a single machine. Tolerances of 0.005 in. are held longitudinally as well as radially.

the roll. Final step in the operation is the pressing of the trigger on the gun. The pin is welded in position in a fraction of a second. Positioning tolerances of 0.005 in. are obtained by the machine both longitudinally and radially. The welding setup allows the operator to maintain a consistent production rate of 7 welds per minute.

Welding Drawn Shells to Aluminum Diecastings

AMONG the operations in assembling Easy portable Whirldry washing machines is that of fastening the drawn 3S aluminum spinner shell to a spinner bottom of 307 aluminum alloy die casting. Before assembly, the shell is acid etched and the outer diameter of the casting is turned down to a shoulder to fit inside the shell.

Formerly, a groove was cut in the die casting and the edge of the shell was spun or clinched into the groove in making the assembly, but this proved too slow for economy. So it was decided that spot welding the shell to the rim of the casting should be tried, using a 150-kva Precision welder. Results attained were both faster and more satisfactory than the prior method, hence the new method is now used in production.

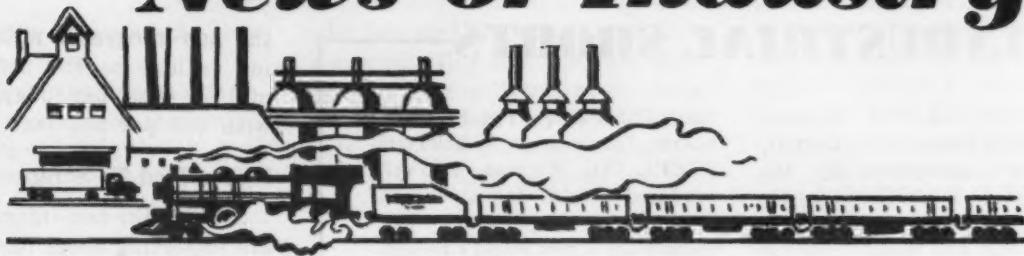
Parts are first pressed together by hand, as before, until the edge of the shell fits against the shoulder and then the unit is set over the lower electrode of the welder. High conductivity Elko-

loy A electrodes are used, the fluted form being preferred because of better water cooling. The lower electrode fits the inside diameter of the die cast lip, but the upper one is domed and is forced against the outside surface of the shell under a pressure of 600 lb. The result is a weld of about $\frac{1}{4}$ -in. diam.

A synchronous General Electric control is used with the welder, which is a straight ac type and is on 10 cycles for about 22,000 amp flow. Six spot welds per piece are made and about 250 parts are welded per 8 hr day. Assemblies are indexed around by hand about 60° between welds.

Electrodes are cleaned with aluminum oxide abrasive cloth after each six welds and are changed after 300 welds have been made. Excellent welds result and provide a better fastening than was attained by the prior method, as no loosening can occur.

News of Industry



New Plant, New Process

Beaver Falls, Pa.—The Babcock & Wilcox Tube Co. will build a \$1 million plant here to hot extrude ferrous metals and alloys in complex sectional shapes. B & W has signed a licensing agreement with the French developers of the process, Comptoir Industriel d'Etirage et Profilage de Metaux, Paris.

Key to the process, which has been used in France for 18 months, is a new concept of lubrication of hot metal. It solves the problem of lubrication and thermal insulation of the die and ingot holder. Isaac Harter, Babcock & Wilcox board chairman, explained that extrusion takes place in a few seconds and at constant temperature; therefore, the full length of the extrusion has uniform mechanical characteristics.

The process—once limited to nonferrous metals—permits forming complicated sections in hard-to-work alloys. As makers of seamless and welded tubing, B & W will use it primarily to make carbon and alloy tubing of various sectional shapes.

Britain Gets Cuban Bus Order

New York—A \$10 million order for 620 buses was placed with the Leyland Motors, Ltd., by the Cuban Modern Autobus Co. William D. Pawley, former U. S. Ambassador to Peru and Brazil and now the Cuban firm's president, signed the order and noted that the buses will replace the streetcar system in Havana.

Hand Sheet Mills Get New Lease on Life

Non-integrated hand sheet mills booked solid through this year . . . Reprieve results from new steel boom . . . Auto industry takes biggest tonnage—By John Delaney.

Pittsburgh—A year ago it looked as if most of the non-integrated hand sheet mills had reached the end of the road. The "post-war boom" was over and consumers were not interested in a premium-priced product. At least one mill had been sold to a dismantler; others were just as badly off.

Now Booked Solid

Some hope was held for the few that had been mechanized and which were producing a specialty product such as silicon and coated sheets. But the ones dependent upon demand for a hot-rolled annealed sheet were on their last legs.

Today, these same mills are booked solid for the rest of the year, could take on first quarter '51 business if they wanted it. As long as demand lasts, the outlook is rosy. The new steel boom has given them a new lease on life.

But it's only a reprieve. When demand eases they'll have tough sledding again.

Autos Take Biggest Tonnage

The integrated sheet mill operators—that is, the ones not dependent upon an outside source for their sheet bar—are not booking orders as far ahead as the non-integrated operators. Their customers are on a monthly allotment basis, which makes for better con-

trol of orders and shipments and lessens the chance of a customer revising specifications before the order is rolled.

Between 70 and 75 pct of some hand mill operators' business is for automotive use, although some others have no automotive orders. Next in order of importance are the appliance manufacturers and the farm implement manufacturers. Grain bin builders are hot after galvanized sheets. Oddly enough, however, one operator reported that demand for hand mill galvanized is not nearly so strong as might be expected. Many galvanized sheet users can't pay premium prices and compete.

Consumers Pay \$40 Premium

The hand mill operators are not concerned about having most of their eggs in the automotive basket. If the automobile producers cut back production, they won't be affected because they have firm commitments for tonnage. It's got to be that way, particularly in the case of the non-integrated mills, because they in turn have committed themselves for sheet bars.

Prices charged by the non-integrated mills for hot-rolled annealed sheets run about \$40 above the regular market price for cold-rolled sheets which these users would normally buy. The integrated mills are getting a \$10 to \$20 per ton premium. However,

INDUSTRIAL SHORTS

CONSOLIDATE—The Electro-Mechanical Devices Co., Detroit, has been purchased by the GEORGE L. NANKERVIS CO., Detroit manufacturers of plating, buffing and metal finishing equipment, as a wholly owned subsidiary. The companies are consolidating their facilities in a new plant at 19255 W. Davison.

EXPANDS FACILITIES—The former Michigan Tool Co. plant in Detroit has been purchased by the MICHIGAN ABRASIVE CO. The new plant contains approximately 65,000 sq ft of floor space and is located on 10 acres of ground.

IN BUSINESS — The CATALYTIC COMBUSTION CORP. has been formed in Detroit for the purpose of designing and manufacturing catalytic elements for use in fume incinerators and other air pollution control devices. R. J. Ruff is president; H. R. Suter, vice-president; and N. C. Ruff, secretary-treasurer.

HEADS GROUP — Grant S. Wilcox, assistant factory manager, Plymouth Div., Chrysler Corp., has been elected president of the ENGINEERING SOCIETY OF DETROIT. He was formerly chairman of the Detroit Chapter, American Society of Tool Engineers and a past national director of that society.

FACTORY BRANCH — A new factory branch and warehouse has been opened at 2832 East Grand Blvd., Detroit, by the Cleco Div. of the REED ROLLER BIT CO. The Cleco Div. manufactures air tools, air line couplings, valves, chisels and other accessories.

WEST COAST JOBBER — The Marshall Steel Co., McCook, Ill., manufacturers of ground flat stock tool steel in water, oil and air-hardening types, has named the LIBERTY EQUIPMENT & SUPPLY CO., Los Angeles, as its exclusive West Coast jobber.

RECORD MELT—The 12 open-hearth furnaces at WEIRTON STEEL CO., Weirton, W. Va., produced 208,467 ingot tons of steel during May, which they claim to be a new world's record. Iron production of 134,375 tons by three 25 ft 6 in. blast furnaces is probably a world record, the company said.

PURCHASE—Bush Aromatics, Inc. of New York has been purchased by DOW CHEMICAL CO., Midland, Mich. Dr. Arthur Behr, director of aromatic research at Dow Chemical for the past 10 years, will head the new division.

BIRMINGHAM PLANT — A new plant in Birmingham will be built by WESTINGHOUSE ELECTRIC CORP., Pittsburgh. The plant will be operated by the Manufacturing & Repair Dept. and will provide extensive overhaul and repair facilities. Land has been purchased on Third Ave. South, between 33rd and 34th Sts. and construction will begin immediately.

CORE OILS COMPANY—Werner G. Smith, recently resigned executive vice-president of Archer-Daniels-Midland Co., has formed WERNER G. SMITH, INC., at 228 Union Commerce Bldg., Cleveland. The company manufactures core oils for the foundry industry and will also process and refine China Wood-oil and various other drying oils for paint and varnish fields.

EASTERN REP—The Federal Machine & Welder Co., Warren, Ohio, has appointed CARBET INC., New York, as eastern representative for their welding equipment and Warco presses.

CHANGES NAME — The Burgess-Parr Co., Freeport, Ill., has changed its name to the ILLIUM CORP. The new name was chosen because of the close association of the company with its principal product Illium, an extremely corrosion-resistant alloy.

the non-integrated mills are paying as high as \$98 per ton f.o.b. mill for sheet bar today, compared with \$55 per ton last November.

Prices Tied To Scrap

Some of the non-integrated mills are importing sheet bar from Belgium and France at a delivered price about \$10 below the domestic price. Quality of the foreign steel is not as good, however, as the domestic. One mill has found it worth while to send two metallurgists to Europe to advise producers there on production and has succeeded in improving quality. It plans to import also from Germany.

Sheet bar prices domestically have risen in step with rising scrap prices for the conversion mills. Contracts with sheet bar producers in some cases carry escalator clauses calling for dollar-for-dollar increases or decreases as scrap goes up or down, while others call for a rise or reduction of \$1.25 for each \$1 change in scrap prices.

Pressure Increases

The pressure for tonnage has become even more intense in the last several weeks. One mill could have booked a 6000-ton order for first quarter delivery; another was offered substantial first quarter tonnage by a farm implement manufacturer and a grain bin builder.

Companies still operating hand mills include Niles Rolling Mill Co., Mahoning Valley Steel Co., Empire Steel Co., Reeves Steel & Manufacturing Co., Parkersburg Steel Co., and its Superior Sheet Steel Div., Newport Rolling Mills Co., Continental Steel Co., Whitney-Apollo Steel Co., and Inland Steel Co.

What Will Happen?

Sheet bar suppliers include Portsmouth Steel Co., Sharon Steel Corp. and Allegheny Ludlum Steel Corp.

What will happen to the hand mill operators when steel demand

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eases was put this way by one operator:

"The fellows who have not modernized and mechanized their mills and who depend largely on hot-rolled annealed sheet tonnage

will fold up. The ones who follow a specialty line and who have modernized their mills and at the same time realize that they cannot compete with the modern continuous mill will be able to carry on."

so they may compete with barge shipping for this business. They have requested a reduction from \$16.35 to \$8.47 a ton.

This same consumer bought a quantity of unprepared scrap and is hoping to keep out of the Chicago market by using it. The company made a saving of a few dollars a ton on the rerolling rails and is expecting to make more foreign purchases. There were three other companies which bought in conjunction with this consumer.

These trends closely parallel the imports of European scrap which took place late in 1948 and early in 1949 when the steel producers were also operating at high rates.

Mills Look Overseas for Scrap Price Lid

Nearly 250,000 tons of foreign scrap bought at or below domestic price . . . Several companies obtain tonnage . . . Mills hope deals will keep domestic prices in check.

New York—In an attempt to get sufficient steel scrap to maintain high level operations and still keep some sort of lid firmly clamped on domestic scrap prices several mills have resorted to substantial imports of European scrap.

Some Will Reach Midwest

Carnegie-Illinois Steel Corp. has reportedly purchased close to 100,000 tons of German scrap. Bethlehem Steel Corp. has been buying some foreign tonnages right along, and several other companies are said to have made recent European purchases. The business thus far transacted comes to an estimated total of 200,000 to 250,000 tons of scrap including No. 1 heavy melting steel, rerolling rails, axles, and cast iron.

The cost of No. 1 heavy melting

steel, bought in Germany and delivered to Pittsburgh can only be roughly calculated. A ton, loaded on shipboard in Europe, costs about \$28.50, ocean freight comes to \$6.00 or \$7.00, unloading charge is \$1.50, and the freight to Pittsburgh is about \$9.00 (some 10 pct lower than for domestic scrap).

This comes to a total of \$45.00 to \$46.00 a ton, just a bit below the recent high of \$47.00 per gross ton in Pittsburgh.

They Did It Before

One steel firm in the Chicago area bought 15,000 tons of rerolling rails, part of a shipment from France, Belgium, and Luxembourg. This is scheduled for docking in New Orleans and delivery in the Chicago area about July 20. One railroad has petitioned the ICC to lower its rates

Atom Facts for Laymen

Chicago—Staged in collaboration with the Westinghouse Electric Corp., "Theatre of the Atom," a scientific show on atomic energy facts for laymen, will be held through Labor Day at the Chicago Fair of 1950.

Elgin Div. to Relocate

Chicago—Elgin National Watch Co.'s Industrial Products Div. formerly at Aurora, Ill., will be shifted to the company's main plant at Elgin, Ill., by the first of August.

MEET THE PRESS:
President Truman is shown at one of his regular semiannual meetings with the Society of Business Magazines Editors. On his right hand is Paul Wooton, president of the Society and Washington representative on the Chilton Editorial Board.





The "Before" Stage

New York—Hastily-conceived guesses that the above gondola rail car has been through an earthquake, cataclysm, or other unnatural violence are erroneous. It has been through a steel mill, hauling scrap and hot slabs. Its sides have buckled and twisted from the buffeting of cranes, shovel dippers, and heavy loads of scrap.

Although the gondola looks ready for scrap pile retirement, the usual industrial practice is to repair it by removing rivets and straightening bent sides under a press. This usually takes from 4 to 5 days.

Another method that spells time and costs saved has been adopted by a steel mill which heats the bent portion of the car with Oxfeld W-26 Blowpipe, equipped with a special multi-flame heating head. Twisted sections are then forced back into shape by jacks. The new method takes 2 days and saves about \$250 per car, reports the Linde Air Products Co., of New York.

New England Scrap Men Meet

Worcester, Mass.—Members of the Boston, Capitol, and Southern New England chapters of the Institute of Scrap Iron and Steel, Inc., visited the plant of the American Steel and Wire Co. here on June 21 and later attended a banquet where company officials were guests.

At the dinner, presided by David B. Reisner, president of the sponsoring Boston chapter, members did much to further mutual understanding in the scrap trade. Edwin C. Barringer, executive vice-president of the Institute, was toastmaster.

GE Lab Nears Completion

Schenectady—Completion and occupation of the new General Electric Research Laboratory is slated for late August, announced Dr. C. G. Suits, GE vice-president and director of research. He added that most of the laboratory divisions still located at the GE works in downtown Schenectady are now moving to meet the August occupancy schedule.

The five major buildings will have a usable area of 185,000 sq ft. The main 5-story building will house the Radiation Lab and its 300 million volt synchrotron and other atom smashers.

Studebaker Assembly Plant To Be Built in New Jersey for '51

New Brunswick, N. J.—A \$5,500,000 plant to assemble passenger cars within the eastern market will be built near this city by Studebaker Corp. on a 165-acre site bought from the Pennsylvania Railroad.

Contracts have been let for immediate construction scheduled for completion in March 1951, announced Harold S. Vance, chairman and president of Studebaker. The one-story plant, with 400,000 sq ft of floor space, will have a production capacity of 85,000 autos per year, assembling, painting and trimming, and assembling complete cars. Initial employment is set at 2500.

The tract is located at the intersection of U. S. Highway No. 1 and the main line of the Pennsylvania Railroad. The main Studebaker plant is at South Bend, Ind.

Mason Reelected Auto Assn. Head

Detroit—George W. Mason, president of Nash-Kelvinator Corp., has been reelected president of the Automobile Manufacturers Assn.

Other reelected officers are: H. S. Vance, Studebaker Corp., and E. J. Bush, Diamond T Motor Car Co., as vice-presidents; M. E. Coyle, General Motors Corp., secretary; Hugh J. Ferry, Packard Motor Car Co., treasurer; Alfred Reeves, advisory vice-president; and William J. Cronin, managing director.

To Double Car Output

Detroit—General Motors Corp. is planning to approximately double the output of its Chevrolet and Fisher Body plants in the Cincinnati area. In its Norwood plant, Chevrolet plans to increase its output from 550 cars and trucks a day to nearly 900. Fisher Body Div. is hiring an additional 1000 men before the end of June.

Two-shift operations are being carried out at both plants for the first time since 1946.

Justice Dept. Files Suit Against United Engineering Co.

Washington—The Justice Dept. has filed a civil suit in the Pittsburgh Federal Court charging United Engineering & Foundry Co. with violation of the Sherman Act.

Assistant Attorney General Bergson charged that the firm had entered into cartel agreements with 13 foreign firms which divided the world into marketing areas and not only eliminated competition among themselves but acted in restraint of world trade in rolling mills and equipment.

Named as co-conspirators were a Canadian, three English, one Japanese, one Australian, two Belgian, and five French firms.

It is asked that the court declare the existing contracts void and illegal and that United Engineering be restrained from reviving or renewing any of the practices charged in the complaint.

RFC to Make Tin Sales

Washington—The Tin Sales Corp. has announced that effective at the close of business on June 30 the Reconstruction Finance Corp. will make all sales of tin from its Washington office at 811 Vermont Ave. N. W., Washington 25, D. C.

The RFC proposes to issue instructions soon as to purchasing procedure for government tin.

The Tin Sales Corp. office will no longer remain open as agent for the RFC.

Workers Approve GM Pact

Detroit—The new General Motors agreement has received overwhelming support from workers. Of the first 73 out of 117 bargaining units voting on the contract, 65 units representing 232,000 workers approved the pact. Only eight units representing 14,200 employees were opposed to the new agreement. The contract is supported by a majority in binding on all GM units.



Bon Voyage to Texas Tunnel

Orange, Tex.—A unique construction method is being utilized by the Consolidated Western Steel Co. in building the Houston Ship Channel tunnel for a new section of the Baytown-Pasadena Highway.

Rather than fabricate the protecting 36-ft diam steel shell on the spot, it is welded together, first in 20-ft and then in 300-ft sections, at Orange, 125 miles from the tunnel site. Then 44-ton watertight bulkheads are placed at each end and 75 tons of reinforcing bars are stored in the bottom for ballast.

Nine of these 300-ft sections, weighing more than 600 tons, are launched into the Sabine River and floated through the Gulf of Mexico to their final position where they are separately sunk into a previously dredged underwater canal. Finally, the sections are welded together to form the 2700-ft tunnel and the concrete work is completed.

In the initial stages of construction, the 20-ft sections, weighing 31 tons, are manually welded as they rotate on special automatic turning rolls built by the Worthington Pump and Machinery Corp.

The mammoth size of the sections is easily seen by comparing one to the two tugboats shown in the picture.

Canada GM Signs 5-Year Contract

Toronto—Following the precedent set by the parent company, General Motors Co. of Canada signed a 5-year labor agreement with the United Automobile Workers last week, reported William A. Wecker, president.

The settlement grants an immediate wage increase of 3¢ per hr with an annual increase of 3¢ during the span of the contract; \$55 per month pensions to workers with 30 years' service at the age of 65, paid by the firm; a progressive reduction to a 40-hr work week from the present 44; extension of the cost-of-living wage formula; and other benefits.

To Distribute New Torch

New York—The new Prepo Torch, which, it is claimed, gives an instant heat of 2200° F with no preheating, pumping, or priming, will be distributed nationally for the welding industry by the Air Reduction Sales Co., a division of the Air Reduction Co., Inc.

To Handle Chain Exports

Bridgeport, Conn.—The American Steel Export Co., Inc., New York, has been appointed as export representative of the Bridgeport Chain & Mfg. Co., recently announced Bridgeport vice-president F. A. Diel.

Machine Tool Business Improves—But

Builders know they have a tough fight ahead . . . Twofold selling job looms—selling tools and selling accelerated depreciation to industry, public and government.

New York — Even though new business taken by machine tool builders in May sets a postwar record, machine tool people know they have a tough fight ahead of them. They are still seeking new applications and new fields where they can apply their skill. Some are living by their wits.

It has been said in the industry that the builders are measuring one another's business acumen by their agility in entering and establishing themselves in new industrial fields—some of which were formerly considered unrelated to machine tools. Of course this is an exaggeration. But tool builders have gone into such diverse fields as knitting machinery, agricultural equipment, road building machinery, and so on.

The Biggest Problem

The industry feels that its biggest problem today is antiquated treasury regulations and administration tax policy. There is little doubt that a lot more sales could be made if these restrictions were used.

An examination of the foreign market doesn't brighten the picture. Although there are continuing sales abroad for many special purpose high production units, foreign nations are rapidly building up their own machine tool industries. These are devoted almost wholly to universal type machines. They are cutting off imports of dollar general purpose equipment by quotas and tariffs.

New Product Lines Help

The machinery industries of most of the foreign nations are being pushed ahead under forced draft by special treatment of governments anxious to rebuild this and other basic industries. There

is no indication that this trend will be reversed.

Many of the new orders now being received are for new product lines. Machine tool builders are pleased about this because it represents a growing sales potential, as well as future replacement business.

Big Sales Job Ahead

Builders of machine tools know that they have to sell more than just tools. And they have to reach more people than the customers who buy from them. They have to sell the need for revision of the antiquated treasury regulations on depreciation. And they need to sell it not only to their customers, but also to industry generally, to the public, and eventually to the government.

They have a good story, too. One of the principal features of the U. S. economy is that the material advantages of efficiency have been distributed more widely than in any other nation. This really means that our industries have been able and alert in applying

the newest developments in production equipment.

The machine tool people feel that if this is to continue to be true some form of accelerated depreciation must be adopted, and they are out to tell the world about it.

Meanwhile they don't feel too badly about the upturn in their business.

Freight Car, Locomotive Orders Mount, Says Rail Assn.

Washington — Mounting orders for new freight cars and locomotives, particularly diesels, by American railroads are reported by the Assn. of American Railroads. Orders for 36,219 freight cars were placed in the first 5 months of '50 by Class I roads and railroad-controlled private refrigerated car companies. This was seven times as many as were ordered in the comparable period of 1949.

Diesels Hog Picture

New 1950 installation of locomotives into service were 922, of which only four were steam. The total was higher than in any period since 1923. In May alone, the roads put 230 locomotives into service. On order as of June 1 were 1009 locomotives with 996 of them diesels.

Backlog of freight cars remaining on order were 41,439 on June 1. The bulk, 24,537, will be constructed by independent car builders. Class I roads and subsidiary refrigerator car companies put 9148 freight cars into service this year.

Castings Subcommittee Confers

Cleveland — Foundry Industry Advisory Subcommittee on Gray Iron Castings to the U. S. Munitions Board met in Washington, June 14, Gray Iron Founders Society, Inc., announced here.

Personnel of the Subcommittee, all members of GIFS, are: W. L. Seelbach, president, Superior Foundry, Inc., chairman; C. R.



"Announcing Mr. Milton Turner—factory representative for the Canton Caster Co."

Culling, president, Carondelet Foundry Co.; H. P. Good, foundry superintendent, Textile Machine Works; E. C. Hoenicke, general manager, Eaton Mfg. Co., Foundry division; G. F. Hutchins, 2nd, treasurer, Standard Foundry Co.

And: J. L. Long, vice president, Atlas Foundry & Machine Co.; C. R. McGrail, president, Texaloy Foundry Co.; J. M. Price, president, Ferro Machine & Foundry Co.; P. E. Rentschler, president, Hamilton Foundry & Machine Co.; E. L. Roth, president, Motor Castings Co.; E. B. Smith, vice president, Brake Shoe & Castings Div., American Brake Shoe Co.

New Era of Progress For Electroplating Seen at Meeting

Boston—Elimination of expensive buffing and polishing operations before and after electroplating will be part of the new era of progress forecast for the electroplating industry at the thirty-seventh annual convention of the American Electroplaters' Society and Fourth International Conference on Electrodeposition.

Technical papers testified at the meeting that buffing and polishing to obtain the coveted bright finish on electroplated ware can be bypassed with new measures being introduced to the industry.

Remarkable effects were described in a paper by C. E. Reinhard, of the New Jersey Zinc Co. An exponent of micro-throwing power, he showed how small defects are filled with metal during some plating operations for an improvement of surface quality and to promote more economical production.

Demonstrate New Mining Machine

Huntington, W. Va.—A continuous coal mining machine, designed to drill, cut, shoot, and load coal in one operation, was demonstrated here on June 23 by Bituminous Coal Research, Inc., at a meeting of officials of coal companies, coal hauling railroads, and coal land companies.

Allegheny Ludlum Has Good Neighbor Policy

Starts community report meetings 4 years ago to improve relations . . . Meetings end town's objections to stainless wire mill . . . Townsfolk now participate.

Brackenridge, Pa.—Four years ago Allegheny Ludlum Steel Corp. took its first planned steps toward improving community relations instead of just drifting along trying to be a good neighbor.

The company instituted community report meetings at which people heard top executives tell what the company stood for; what its future plans were; what its problems were and how it hoped to solve them. The purpose was to promote good relations through understanding.

Feeling Its Way

The company was feeling its way at these first meetings, was perhaps more aggressive than it had to be. As it turned out, there was no need for super-aggressiveness. The communities demonstrated willingness to listen, and understand.

Allegheny Ludlum then scheduled community report meetings each year, constantly trying to improve its technique and being as frank as a company can be about what it is thinking, doing, and planning.

Shindig for a City

Middletown, Ohio—Come one, come all to the birthday party extravaganza of Armcost Steel Corp. which will celebrate its fiftieth anniversary on July 12 by being a good industrial neighbor and issuing a blanket welcome to every man, woman, and child in this city for festivities, food, and refreshments in Sunset Park.

In announcing the town party, Charles R. Hook, Armcost chairman, acknowledged that Middletown had "played a vital role in Armcost's progress" and that town and company had worked together and grown together. Armcost employees will be hosts.

Suspicion disappeared with understanding and a better feeling developed. During the war, Allegheny Ludlum operated a bullet-core plant for the government at Dunkirk, N. Y. With the war over, the company wanted to buy it and convert it into a stainless steel wire mill.

Community Participation

The people of Dunkirk were against this because they wanted to diversify the town's industrial output. After the first community report meeting, Dunkirkers changed their minds, even sent a delegation to Washington in behalf of A-L. The plant now is producing stainless steel wire.

Until this year, the community report meetings were a one-way street with the company doing all the pushing. The communities were interested and cooperative, but not too aware that they, too, had responsibilities. This year it was different.

At recent meetings, community leaders shared the spotlight with company executives. The town's business and civic leaders reported to the company what they are doing and hope to do to improve their communities.

Banker Takes Floor

George Stuart, editor of the Valley Daily News, Tarentum, Pa., which serves the Brackenridge plant community, read a report prepared by the town's Civic Betterment Committee. He listed community assets and needs and pointed to things the community was doing or had done to benefit the area's largest employer.

Community leaders answered their share of townsfolk's questions. Frank Irvine, president of one of the Brackenridge area banks, replied to such questions

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Pension Perspective"

IT would hardly be correct to say that the dust has settled over the pension issues. Not after it has been made a sensational issue in coal, steel and automobiles. Nevertheless we can now apply a better perspective to the problem than was possible when John L. Lewis, Philip Murray and Walter Reuther were dragging it across the headlines.

On the whole this longer and calmer look at the pension problem is reassuring. The prominence of pensions in recent wage negotiations had led to fears that business generally was about to be saddled with new and intolerable burdens.

The emphasis on the pension issue in recent wage negotiations simply reflects labor opportunism and is in no sense a revolutionary innovation in bargaining objectives. Many industries, with or without pressure from organized labor, had already adopted pension plans. Most of the workers in utilities, railroads, banking, insurance, chemicals, paper, oil refining, meat packing and tobacco were already covered by pension plans.

By the end of 1949 some 12,000-13,000 companies had plans covering 5 to 6 million workers. It is estimated that by early 1951 this total will be raised to more than 10 million. The interesting thing about this figure of 10 million is that it represents about two-thirds of all workers who, as a practical matter, are potentially capable of coverage under company pension systems.

A sober analysis of cost, after the heat of controversy has subsided, shows that it will not be ruinous. Pension payments can hardly be a new total charge against corporate earnings. Companies without pension plans usually make particular

provisions for older employees, either retaining them longer at reduced pay or retiring them on specific allowances. The pension dollar is a proper charge to costs and therefore reflects a tax saving. There is a possible offset in the form of higher social security payments. On the basis of evidence now available, it appears that pension plans providing retirement pay at half the rate of the worker's full time income may average not more than 5 pct of payrolls.

In view of wage concessions won by labor in the postwar period this can hardly be regarded as ruinous. Although the reasoning of the Steel Board in its report to President Truman last September is open to question, there can be little doubt that the public generally accepts its conclusions that pensions are a "normal business cost," that they must be met "in much the same way" as charges "for depreciation and insurance of plant and machinery."

It is also clear now that the annual accumulation of pension contributions will not present an insoluble problem for the financial market. It had been feared that these increments would be so large as to depress money rates and create a stampede for eligible securities. Total payments into pension funds in 1949 are estimated at \$1.2 billion. By the end of 1951 these annual contributions may reach a total of \$1.7 billion. The financial community should be able to handle this in its stride.

It is to be hoped that these large scale, carefully calculated provisions for the worker's old age, operating under responsible private auspices, will provide the desired security for the worker and promote better employee relations in industry.

as, "How can the schools better coordinate education with industry?"; "What are the chances for a trade school?"

The questions indicated a high community interest in production and plant improvement problems. Someone asked about continuous casting and titanium. A company motion picture, "The Fifth Freedom," based on the theme that freedom of opportunity is building a bigger and better America, carried a passage demonstrating company progress in continuous casting. The answer to the titanium metal question is that even at \$20 per lb., the company cannot supply the demand.

Describes Developments

In reply to a question on company research activities, Frank B. Lounsherry, vice president, reported these developments in the past year: A high chrome-high nickel alloy for gas and jet turbine wheels—the first for this purpose; an alloy for pots and containers to hold molten metal; a precipitation hardening type of stainless; a new tool steel with twice the abrasive index of anything made before; a new carbide for heavy milling and machining of steel; two titanium-base alloys, one of which, with a tensile strength of 150,000 psi, has definite possibilities for structural applications.

Allegheny Ludlum is completely sold on the value of its community report meetings. It does not claim to have all the answers—new problems crop up every year. It does feel that it's on the right track.

Many other companies have asked Allegheny Ludlum for details of its program. It is now busy making copies for requests.

First Mechanics Congress Held

Chicago—The Illinois Institute of Technology was host at the first National Congress of Applied Mechanics recently, reports Lloyd H. Donnell, general chairman and research professor of mechanics at the school.

Strike Explains Why Steel Does Not Build in New England

Strike tells Council that survey seeks profit basis for mill.

Bretton Woods, N. H.—Studies to determine the economic feasibility of constructing a steel mill in New England will be conducted by the New England Steel Development Corp., said Clifford S. Strike, president, last Friday at the New England Council's ninety-ninth quarterly meeting here.

Cost Set at \$250 a Ton

If a 4 to 6 months' market survey to determine if the steel mill can be operated profitably shows favorable results, technical and financing and operating studies will follow, said Mr. Strike, also president of F. H. McGraw & Co., Hartford, Conn.

He said that cost of the mill had been tentatively set at \$250 million, equal to \$250 per ton of annual production. Mr. Strike pointed out that major steel companies had "good and substantial reasons" for not building a mill in this region. He said that they might for the same money produce more steel by expansion of existing mills.

Profit Possible

After citing U. S. Steel's building a mill in eastern Pennsylvania rather than New England because the firm's market survey probably indicated the former site as more suited to their requirements, Mr. Strike said that "none of these reasons is proof conclusive that a New England Mill" would not be profitable. He added that "with all the steelmen I have talked to, none has denied that possibility."

In a panel discussion of the New England transportation situation, Robert M. Edgar, assistant to the president, Boston and Maine and Maine Central Railroads, warned that the section's railroads were "unhealthy at the moment" because they were regulated as monopolies. He said that New England rails could be seriously weakened to a point of financial

collapse and Federal ownership by competition.

Richard M. Bissell, Jr., assistant administrator for program, ECA, indicated that revived foreign trade would stimulate New England production by importation of inexpensive raw materials and manufactured goods. Lloyd J. Hughlett, of Arthur D. Little, Inc., urged manufacturers to develop improved products at low prices and to utilize foreign trade opportunities.

Henry Hansen, director Economic Policy Div., NAM, demanded a halt to the constant shift of federal antitrust policies resulting from court decisions and other rulings. John J. Halloran, vice-president, Sprague Steamship Co., reported that the area's ocean shipping industry was hindered by railroad differentials on cargo from the Midwest.

Rail Business Picking Up, Reports Pennsylvania RR Head

Pittsburgh — Business is good and the outlook is rosy, says Walter S. Franklin, president of the Pennsylvania Railroad.

Mr. Franklin is optimistic for two reasons: (1) freight movements during the week of June 18 averaged more than 90,000 loaded cars daily, highest since mid-December, 1948, and (2) there are indications, too, that recent adjustments in freight rates on steel products are bringing steel back to the railroads in substantial volume.

On the second point, the PRR president referred to the new low rate on 80,000 lb. carload steel shipments, put into effect May 1 to get back business lost to truckers. During May, despite the rail strike, one trucker estimated that his steel tonnage was off 13 pct, and is likely to be off about 25 pct for June.

Mr. Franklin added that due to the late opening of the ore season his railroad expects a very heavy movement of ore for the remainder of the season, plus heavy shipments of coal to the head of the Lakes.

Youngstown Expansion

Chicago — Four new open-hearth furnaces and other facilities to add from 250,000 to 300,000 ingot tons to their Indiana Harbor works present annual capacity of about 4 million tons will be built by the Youngstown Sheet & Tube Co., announced company officials last week. In addition to furnaces, a new roll shop will be constructed at the Indiana Harbor strip mill and more finishing facilities will be installed for hot rolled sheets and strip.

American Can Requirement Contracts Shortened by Court

San Francisco — The Federal Court antitrust ruling against the American Can Co. last week did not comply in full to broad government demands for the abolishment of requirements contracts and that American Can withdraw entirely from the manufacture of and leasing can closing machines.

Judge George B. Harris ordered the firm to discontinue: total requirements contracts for periods over a year; quantity discounts to large canners; purchase contracts with more than one plant per contract; maintaining ownership of can closing machines.

The ruling allows requirements contracts on a 1-year basis and makes 5 year contracts illegal. It also refused to order American Can to withdraw from the manufacture and lease of closing machines.

In commenting on the decision, C. B. Black, firm president, said that the ruling upholds the principle that requirement contracts are needed to assure customers a steady and adequate supply of cans despite industry fluctuations.

GM Salaried Workers Pension

Detroit — General Motors salaried workers as well as hourly paid employees will have an improved retirement program. At a special meeting to be held later this year, stockholders will be asked to approve a program for salaried workers' pensions.

• News of Industry •

525 Tons, Cleveland, N. A. C. A. equipment storage.
 500 Tons, Townshend, Vt., 4 span I beam bridge with roadway and approaches. R. J. Maynes, Brattleboro, Vt., district highway engineer.
 350 Tons, Ft. Wayne, Ind., International Harvester Motor Truck Bldg.
 300 Tons, Wauwatosa, Wis., high school and convent building.
 300 Tons, Altoona, Pa., sewage treatment plant.
 295 Tons, South Holland, Ill., Calumet interceptor sewer 13-A.
 250 Tons, Davenport, Iowa, St. Lukes Hospital.
 200 Tons, Detroit, Board of Education garage.
 170 Tons, Miami County, Ohio, highway bridge.
 160 Tons, Derby, Conn., multiple span rolled beam viaduct. E. T. Nettleton, New Haven, district engineer.
 140 Tons, Maine, Acadia National Park, reinforced concrete bridge with approaches on Paradise Hill. George B. Thompson, Bar Harbor, highway engineer.
 109 Tons, Humboldt, Iowa, Humboldt Generating Plant.
 100 Tons, North Chicago, Ill., Motor Products Corp., deep freeze plant.

Billet steel inquiries this week included the following:

175 Tons, Grand Isle and North Hero, Vt., 5 span double leaf bascule bridge with I steel beam approach.

Steel punchings inquiries this week included the following:

170 Tons, Grand Isle and North Hero, Vt., 5 span double leaf bascule bridge with I steel beam approach.

Specifications Study Started

White Sulphur Springs, Va.—To ensure low cost production and high quality through sound engineering design, the Cast Iron Soil Pipe Institute has launched a study of specification requirements for cast iron soil pipe and fittings. Announcement of the project was made by J. J. Nolan, Jr., the group's president and executive vice-president of the Central Foundry Co., at a recent Institute meeting here.

Enters Hot Rolled Field

Philadelphia—Hill-Chase & Co., Philadelphia distributor of cold-finished steel and aluminum, have announced their entry into the hot-rolled steel field. They have built a 32,000 sq ft addition to house the new line which includes angles and channels, bars and beams, sheet and strip, plate and floor plate.

Army Orders Trestles

Washington—Army Corps of Engineers has placed an order with the Jumbo Steel Products Co., Azusa, Calif., for 65 aluminum-steel, 50-ton trestles. The contract price was \$194,025.

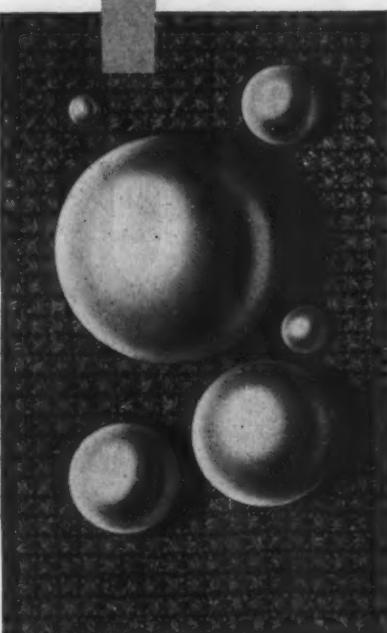
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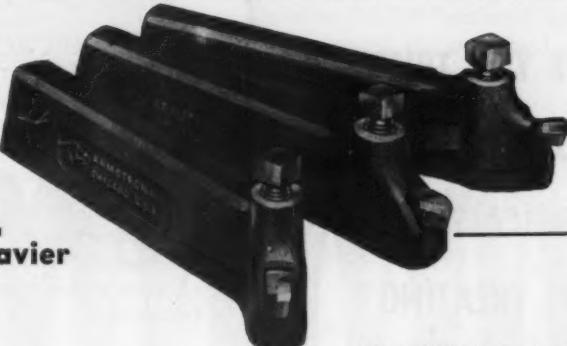
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• News of Industry •

Dates to Remember



June 29-July 1—National Industrial Advertisers Assn., annual conference, Biltmore Hotel, Los Angeles. Association headquarters are at 1776 Broadway, New York.

Sept. 5-9—National Chemical Exposition, Chicago Coliseum, Chicago. American Chemical Society, Chicago Section headquarters are at 86 E. Randolph St., Chicago.

Sept. 12-14—Society of Automotive Engineers, tractor meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 13-15—National Petroleum Assn., annual meeting, Hotel Traymore, Atlantic City, N. J. Association, headquarters are in the Munsey Bldg., Washington.

Sept. 18-22—Instrument Society of America, conference and exhibit, Memorial Auditorium, Buffalo. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 19-21—American Society of Mechanical Engineers, fall meeting, Hotel Sheraton, Worcester, Society headquarters are at 29 W. 39th St., New York.

Sept. 23-26—Packaging Machinery Manufacturers Institute, annual meeting, Homestead, Hot Springs, Va. Institute headquarters are at 342 Madison Ave., New York.

Sept. 26-29—Assn. of Iron & Steel Engineers, exposition and annual convention, Public Auditorium, Cleveland. Association headquarters are in the Empire Bldg., Pittsburgh.

Sept. 27-30—Society of Automotive Engineers, aeronautic meeting and engineering display, Biltmore Hotel, Los Angeles. Society headquarters are at 29 W. 39th St., New York.

Oct. 6-8—National Assn. of Waste Material Dealers, fall meeting, Hotel Traymore, Atlantic City, N. J. Association headquarters are in the Times Bldg., New York.

Oct. 10-12—Society of Industrial Packaging & Materials Handling Engineers, exposition, Convention Hall, Philadelphia. Society headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 12-13—Gray Iron Founders' Society, annual meeting, Netherlands Plaza Hotel, Cincinnati. Society headquarters are at 210 National City-E. 6th Bldg., Cleveland.

Oct. 16-18—Society of Automotive Engineers, transportation meeting Hotel Statler, New York. Society headquarters are at 29 W. 39th St., New York.

Oct. 23-25—American Gear Manufacturers Assn., semiannual meeting, Edgewater Beach Hotel, Chicago. Association headquarters are in the Empire Bldg., Pittsburgh.

Oct. 23-26—American Institute of Steel Construction, annual meeting, Shamrock Hotel, Houston. Institute headquarters are at 101 Park Ave., New York.

Oct. 23-27—National Metal Congress & Exposition, International Amphitheater, Chicago. American Society for Metals

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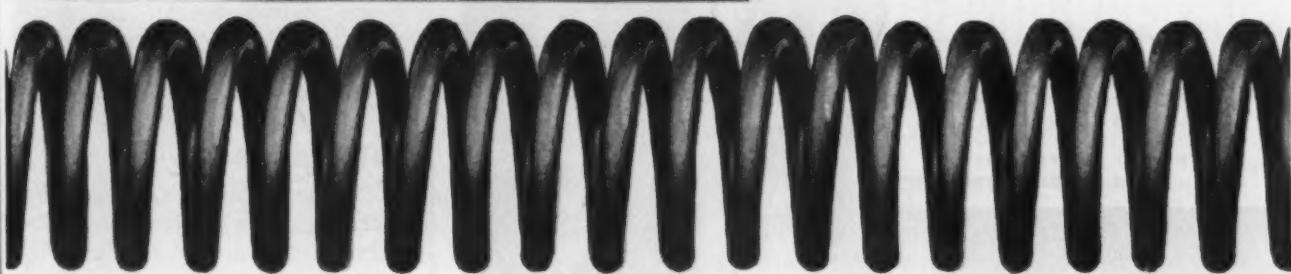
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PUBLICATIONS

Continued from Page 34

sive laboratory, shop and pilot plant operations. *Commonwealth Engineering Co.*

For free copy insert No. 8 on postcard p. 35.

Blower Data Shown

Dimensional information about Standaire blowers is contained in a new 4-p. folder. Also included are typical application data, engineering layout, blower number, important design data and ratings of cfm at listed rpm. *Standard Stoker Co., Inc.*

For free copy insert No. 9 on postcard p. 35.

Light Duty Hose

Servall, Hewitt's answer for an efficient, economical all-service hose, is described in a new 6-p. pamphlet. Suggested applications for this light duty hose in industry are listed, along with specifications and a description of construction. *Hewitt-Robbins Inc.*

For free copy insert No. 10 on postcard p. 35.

Rivets, Rivet Setters

How Chicago split and tubular rivets are made is shown in a new 12-p. catalog listing engineering information and points to consider for selecting the correct rivet. Specifications and prices for a wide assortment of rivets in various types of metals are listed, and numerous models of foot power and power driven single and double rivet setters are shown. *Chicago Rivet & Machine Co.*

For free copy insert No. 11 on postcard p. 35.

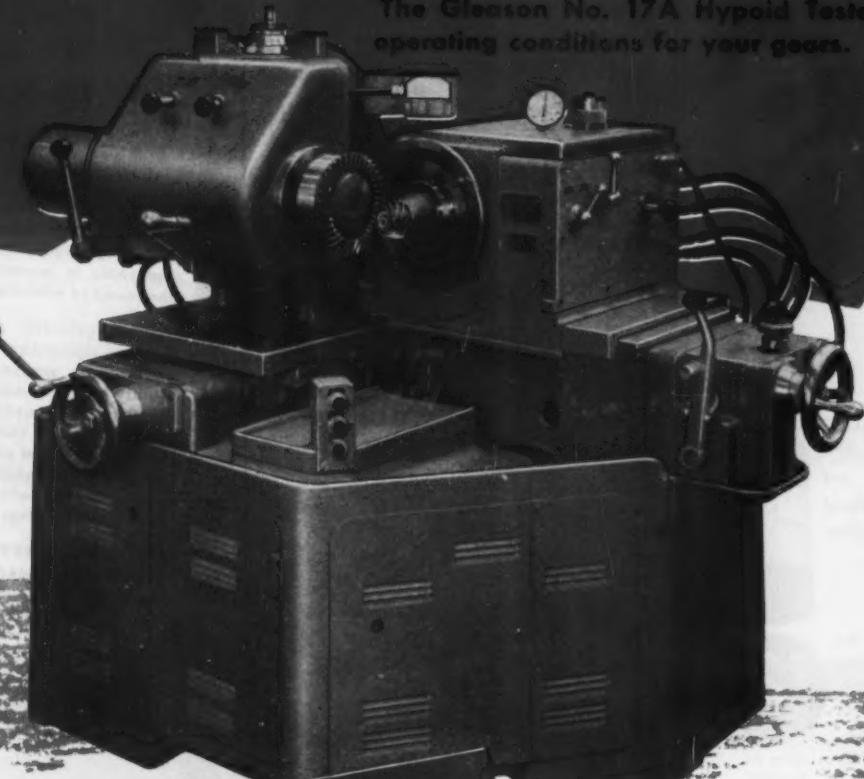
Lubrication Devices

The new 16-p. Gits price guide and catalog is a handy reference and buying guide to the line of lubrication devices and seals produced by the company. Complete price information, table of advantageous discounts, necessary specifications, numerical sequence, identifying illustrations and special announcements highlighting special products are presented. *Gits Bros. Mfg. Co.*

For free copy insert No. 12 on postcard p. 35.
(Resume Your Reading on Page 35)

QUALITY CONTROL FOR YOUR BEVEL GEAR MANUFACTURE

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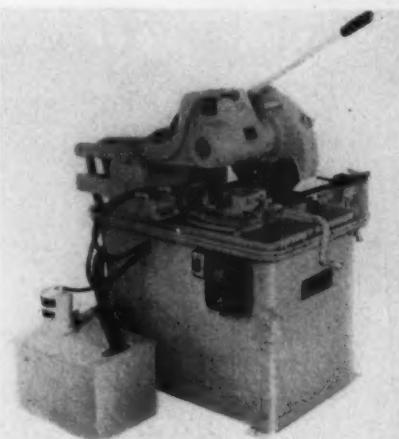
Continued from Page 38

hp capacity, with speed ratios of 6 to 1, and 16 standard types including plain, motorized, single and double reduction geared units for horizontal or vertical mounting. *Link-Belt Co.*

For more data insert No. 25 on postcard, p. 35

Metal Cutoff Machine

A new model Swing-Cut metal cutoff machine equipped for wet cutting has a recirculating pump, tank, hose connections and removable splash guards. The flow of cutting fluid is controlled by the action of the cutting head and



depth of cut is adjusted by a wheel depth control arm operated from the operator's normal position. An adjustable work stop can be used for cutting multiple pieces up to 24 in. long. An air activated self-centering vise, either hand or foot controlled, is also available. *Stone Machinery Co., Inc.*

For more data insert No. 26 on postcard, p. 35.

Electric Furnace

A new, vertical electric furnace features two different temperature ranges. One model with an inside fan assembly provides equalized temperatures up to 1250°F; the second has a maximum temperature of 2000°F without recirculation. Coiled Kanthal heating elements are mounted in refractory

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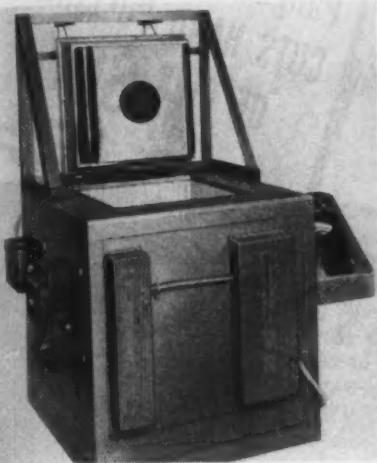
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plates and located on the four sides of the 21x21x30 in. heat chamber. Full heat retention is assured by multi-insulation, a heat-resistant Transite board top, and an asbestos



seal recirculating door. A 292 Wheelco Capacitrol provides temperature control. All exposed metal parts within the furnace chamber are stainless steel. *K. H. Huppert Co.*

For more data insert No. 27 on postcard, p. 35.

Woven Wire Slings

Woven wire slings in standard widths of 3 to 30 in. and from 36 to 132 in. long are constructed from an adaptation of a basic mesh used in the fabrication of Cambridge



woven wire conveyer belts. They are available in any metal or alloy, including stainless steels. Special tempered steel handles on both ends permit the use of a choke or basket hitch around the material being handled. *Cambridge Wire Cloth Co.*

For more data insert No. 28 on postcard, p. 35.

Welder's Clamp

Jaw capacity of the Bernard universal welder's clamp has been increased to 2½ in. One face of each of the two rotating clamps has

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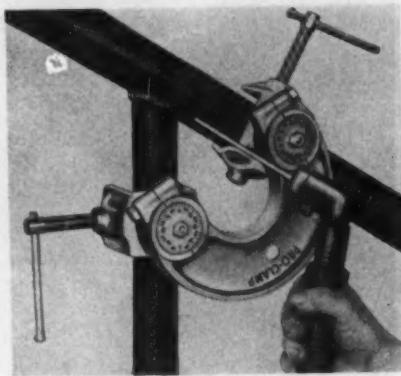


PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

NEW PRODUCTION IDEAS

Continued

a flat surface for gripping plates or other flat surfaces; the opposite face has V form for handling round or oval pieces. Clamps rotate in the U frame through a full



360° and each clamp has a double 180° machine cut protractor scale and a positive locking device. Pro-Clamps are cadmium plated steel and weigh 11½ lb. *Bernard Welding Equipment Co.*

For more data insert No. 29 on postcard, p. 35.

Grinding Attachment

Work is held in collets or on centers in a new cylindrical grinding and indexing attachment designed for surface grinders. Capacity is 6½ in. swing and 7½ in. between centers. The spindle is driven by a built-in motor, through



step pulleys giving speeds of 200, 400 and 700 rpm. A two-way sine-bar tilt arrangement makes it possible to grind tapers up to 45°, forward or rear. Grinding square or angular punches is possible with the use of a 24-division plate. The unit is held in position by the magnetic chuck only. *DoAll Co.*

For more data insert No. 30 on postcard, p. 35.
Resume Your Reading on Page 39

At Fred Heinzelman & Sons
NEW YORK, N.Y.

Pangborn Hydro-Finish
CUTS HAND POLISHING
OF DIES 60%

reports Mr. J. L. Crosby,
General Manager



Shown here is the Pangborn Hydro-Finish unit which set new records at Fred Heinzelman & Sons. A pioneer of heat treated dies, the company reports: Hydro-Finish removes heat treat oxide discoloration, cuts hand polishing 60% to 70%, holds tolerances to a precision .0001".

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Hydro-Finish is the answer to modern cleaning, decorating and finishing problems. As Fred Heinzelman & Sons have found, Hydro-Finish virtually eliminates tedious and expensive hand buffing and polishing on tool and die maintenance. Now, dies with heavy oxide discolorations can be cleaned faster and at lower cost.

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MARKETS & PRICES

Briefs and Bulletins

price increase — Superior Steel Corp. announced increases of \$7 and \$14 per ton on its hot and cold-rolled deoxidized copper clad strip 10 pct of overall gage, effective June 13. Cold-rolled, two sides, was advanced from \$24.95 to \$25.65 per 100 lb, one side, from \$20.35 to \$20.70; hot-rolled, two sides, from \$21.70 per 100 lb to \$22.40, and one side, from \$16.85 to \$17.20. It was the second advance since May 22 when the company announced identical increases, making the total \$28 per ton for two sides, and \$14 for one side, in the last month.

video steel price — A 2½c per lb drop in its mill price of USS 17, T.V., a special grade of stainless steel for television tube cones, was made effective last Monday, at 12:01 a.m., by the Carnegie-Illinois Steel Corp. The new price of 40c per lb was made possible because of "wide acceptance" of the video steel and resultant increased volume of production, said the company. Other producers are expected to follow immediately. It is estimated that an average of 10 lb per cone is now being used by the TV industry.

stainless increases — Reflecting increased costs of nickel (8c per lb) and general increases in manufacturing costs since Aug., 1949, U. S. Steel Corp subsidiaries have increased prices of stainless steel products effective June 28. Tubular products were up 1.50c per lb, cold-rolled strip, cold-drawn wire and cold-drawn bars, 1.50c per lb, ingots, blooms, billets and slabs for rerolling and tube rounds, 1c per lb, hot-rolled strip 1.25c per lb, and all other stainless products excepting plates, 1.50c per lb. Plates were not increased, remaining at 32c per lb base. Other stainless producers are expected to take similar action.

more steel — Household equipment manufacturers are asking for more steel for products ranging from electrical appliances to garbage pails. One appliance maker reports an order backlog on refrigerators of 50,000 units, on gas ranges 30,000 to 40,000. At current production rates this backlog extends for about a month—but is hard to make up when items are sold as fast as they come off the line.

strip advances — Price increases of \$7.00 per ton on cold-rolled strip was announced by Thomas Steel Co. Other mills, principally the non-integrated operators, had announced a similar advance earlier.

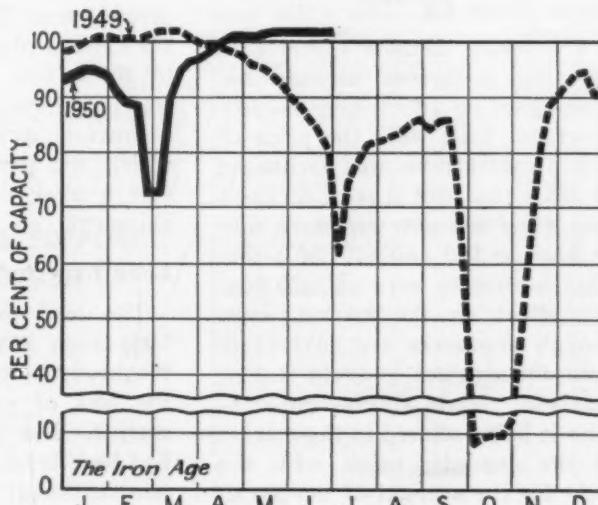
galvanized pipe — Reflecting the effect of zinc price rises, galvanized pipe producers announced price increases of \$6.00 to \$8.00 per ton last week. Youngstown Sheet & Tube, Bethlehem Steel, National Supply Co., Jones & Laughlin, Republic Steel, Fretz-Moon Tube Co., and Wheeling Steel reduced discounts three points, or \$6.00 per ton. Pittsburgh Tube Co. advanced prices \$8.00 per ton and similar advances by other producers were expected momentarily.

hard hit — One of the industries hardest hit by the steel shortage is the heating and ventilating industry. One company reports it has been forced to buy higher grades of steel than required at much greater cost to keep in production. They are considering a shutdown if the situation does not ease.

solid booking — Stainless strip is booked solid through the third quarter and some orders are on the books for fourth quarter delivery. Stainless sheets are booked through August. With few exceptions, alloy order books are filled through July.

lithium prices — Price reductions of up to 10 pct on its lithium compounds are announced by the Foote Mineral Co., Philadelphia.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
June 18.....	103.0	104.0	93.0	88.0	99.0*	104.0	104.0	104.0	111.0*	101.4*	88.0	80.8	112.0	101.5
June 25.....	103.0	104.0	93.0	88.0	99.0	104.0	101.0	104.0	107.0	103.8	84.5	88.9	110.0	101.5

* Revised.

Nonferrous Metals Outlook

Market Activities

Heavy demand continues for zinc and copper . . . Lead price drops $\frac{1}{2}$ ¢ . . . See zinc price rise . . . Tariff to raise copper by 2¢ . . . War starts tin up.



by JOHN ANTHONY

New York—The metal markets grew a little more spotty last week. Copper and zinc continued in very heavy demand. But the lead market dropped $\frac{1}{2}$ ¢ per lb. Ingot makers dropped their buying prices for brass scrap $\frac{1}{2}$ ¢ to 1¢ a lb, which was reflected in dealers' buying prices. Copper scrap prices were unchanged, although it is understood that quantities of heavy scrap can command premiums well above quoted prices.

Joplin Prices Up

The heavy demand for zinc is pressing producers, already beginning to be affected by the ore shortage. Last week the price of Joplin concentrates was unchanged at \$95 a ton. But it is understood that some concentrates were sold as high as \$99 and \$101.50 a ton. This is sure to have an inflationary effect on the market, even though producers are anxious to hold down prices to avoid loss of markets. High Grade imported zinc is being offered to the market at the domestic price, with the duty for the account of the buyer.

Shipments of brass and bronze ingots have been climbing steadily this year to a May figure of 23,643 tons, according to the Ingot Brass and Bronze Industry. The pattern of the first 5 months would indicate shipments for the year well above the 1949 postwar low of 175,643 tons. So it was with something of a surprise to learn that the competition for scrap had ended, indicating a tapering off in business.

Smelters are apparently banking on further reductions in the price of lead. The smelting charge for battery plates has been raised to \$50 a ton. In addition, some smelters have put into operation a buying arrangement under which they pay on the price in effect a week after arrival of the shipment.

Long Expected Drop

The lead price reduction had long been expected, considering the heavy volume of imports and the lack of real activity in the market. For a time the market had been brisk, reflecting the bullish sentiment of buyers toward

the metal markets in general. Some factors feel that the lead market had lost stability by being raised to an artificially high level.

The 15¢ rise in the price of cadmium has been taken in stride without any reduction in buying interest. Production of the metal is quite low, usually less than 4000 tons a year, and imports are negligible. Any surge in demand is sufficient to turn a surplus into a shortage.

Copper Sold at $23\frac{1}{2}$ ¢

Domestic and foreign demand for copper is very great. It has been reported that copper has been sold as high as $23\frac{1}{2}$ ¢ by one factor in the market, neither a producer nor smelter. The mine strike in Chile has recently been settled, after a shutdown of more than 2 weeks. The uncertainty over the copper tariff has created some chaos in the market. But there is no uncertainty over the 2¢ rise in the copper price due on July 1. The House Ways and Means Committee will hold hearings on the Patterson suspension bill starting July 10.

American Smelting & Refining Co. has started production at its new anode casting plant at Garfield, Utah.

War in the Far East has already begun to stimulate professional tin buying. The price increased by over 2¢ a lb in 2 days. Consumer buying has not begun yet.

NONFERROUS METALS PRICES

	June 21	June 22	June 23	June 24	June 25	June 27
Copper, electro, Conn.	22.50	22.50	22.50	22.50	22.50	22.50
Copper, Lake, Conn.	22.625	22.625	22.625	22.625	22.625	22.625
Tin, Straits, New York	76.975	76.50	76.375	....	77.50	*78.50
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	11.80	11.80	11.30	11.30	11.30	11.30

Note: Quotations are going prices.

*Tentative.

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 28, 38, 27.4¢; 48, 61S-O, 29.4¢; 52S, 31.4¢; 24S-O, 24S-OAL, 30.3¢; 75S-O, 75S-OAL, 36.5¢; 0.081 in., 28, 38, 28.4¢; 48, 61S-O, 30.7¢; 52S, 32.8¢; 24S-O, 24S-OAL, 31.4¢; 75S-O, 75S-OAL, 38.5¢; 0.082 in., 28, 38, 30.0¢; 48, 61S-O, 34.0¢; 52S, 36.7¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 48.1¢.

Plate: 1/4 in., and heavier: 28, 38, F, 24.8¢; 48-F, 27¢; 52S-F, 28.1¢; 61S-F, 27.6¢; 24S-F, 24S-FAL, 28.1¢; 75S-F, 75S-FAL, 34.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 67¢; 11 to 13, 34.3¢ to 79¢; 23 to 25, 36.3¢ to \$1.08; 35 to 37, 43.3¢ to \$1.66.

Red, Rolled: 1.5 to 4.5 in., 28-F, 38-F, 34.5¢ to 31¢; Cold-finished, 0.375 to 3 in., 28, 38, 37¢ to 32.5¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4, 1/4 to 11/32 in., 49.5¢ to 88.5¢; % to 1 1/2 in., 88¢ to 36¢; 1 9/16 to 3 in., 36¢ to 38¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 28, 36.5¢ to 52S; 52S, 44.5¢ to 32.5¢; 58S, 47.5¢ to 39¢; 17S-T4, 50.5¢ to 28¢; 61S-T4, 45¢ to 34.5¢; 75S-T6, 76.5¢ to 55.5¢.

Extruded Tubing, Rounds: 63S-T6; OD in. 1 1/4 to 2, 33.5¢ to 49¢; 2 to 4, 30.5¢ to 41.8¢; 4 to 6, 31¢ to 37.8¢; 6 to 9, 31.5¢ to 39.3¢.

Roofing Sheet, Flat: 0.019 in. x 28 in., per sheet, 72 in., \$1.008; 96 in., \$1.344; 120 in., \$1.679; 144 in., \$2.017. Gage 0.024 in. x 28 in., 72 in., \$1.224; 96 in., \$1.633; 120 in., \$2.042; 144 in., \$2.451. Coiled Sheet: 0.019 in. x 28 in., 24.7¢ per lb; 0.024 in. x 28 in., 28.7¢ per lb.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, 1/4 in., 54¢-56¢; 18.88 in., 56¢-58¢; B & S gage 8, 54¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-\$1.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., 1/4 to 0.311, 58¢; 1/2 to 1/4, 1.74¢; 43¢; 2/3 to 5, 41¢. Other alloys higher. Base: Up to 1/4 in. diam, 10,000 lb; 1/2 in. to 1 1/4 in., 20,000 lb; 1 1/2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 2.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.8 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 48¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, 1/4 to 5/16, 31.14; 5/16 to 1/2, \$1.02; 1/2 to 5/8, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, 5¢ to 7/16, 85¢; 5¢ to 5/8, 62¢; 1 to 2 in., 57¢; 1.05 to 0.219, 5¢ to 5/8, 54¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in. Up to 1 1/2 in., 10,000 lb; 1 1/2 in. to 3 in., 20,000 lb; 8 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

"A" Nickel Monel

	Sheets, cold-rolled	69	53
	Strip, cold-rolled	75	56
	Rods and bars	65	51
	Angles, hot-rolled	65	51
	Plates	67	52
	Seamless tubes	98	86
	Shot and blocks	46	

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Extruded		
	Sheets	Rods	Shapes
Copper	37.43		37.03
Copper, h-r	33.28		
Copper, drawn	34.53		
Low brass	35.52	35.21	
Yellow brass	34.19	33.88	
Red brass	35.96	35.65	
Naval brass	38.90	32.96	34.22
Leaded brass		28.54	32.65
Com'l bronze	36.93	36.62	
Manganese bronze	42.40	36.27	37.85
Phosphor bronze	55.11	55.36	
Muntz metal	37.13	32.69	34.94
Everdur, Herculey, Olympic, Olympia, etc.	42.05	40.99	
Nickel silver	10 pct	45.48	47.74
Arch. bronze			32.65

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum Ingot: 99+%, 10,000 lb, freight allowed 17.50

Aluminum Pig: 16.50

Antimony, American, Laredo, Tex.: 24.50

Beryllium copper: 3.75-4.25% Be dollars per lb contained Be \$24.50

Beryllium aluminum 5% Be, dollars per lb contained Be: \$56.00

Bismuth, ton lots: \$2.00

Cadmium, del'd: \$2.15

Cobalt, 97-99% (per lb): \$1.80 to \$1.87

Copper, electro, Conn. Valley: 22.50

Copper, Lake, Conn. Valley: 22.625

Gold, U. S. Treas., dollars per oz: \$35.00

Iodium, 99.8%, dollars per troy oz: \$2.25

Iridium, dollars per troy oz: \$100 to \$110

Lead, St. Louis: 11.30

Lead, New York: 11.50

Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb: 21.50

Magnesium, sticks, 100 to 500 lb: 37.50¢ to 39.50¢

Mercury, dollars per 76-lb flask f.o.b. New York: \$70 to \$71

Nickel, electro, f.o.b. New York: 51.22

Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel: 44.25

Palladium, dollars per troy oz: \$24.00

Platinum, dollars per troy oz: \$66 to \$69

Silver, New York, cents per oz: 72.75

Tin, New York: 78.50

Zinc, East St. Louis: 15.00

Zinc, New York: 15.72

Zirconium copper, 50 pct: \$6.30

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 Ingot: 21.75-22.00

No. 115: 21.25-21.50

No. 120: 20.75-21.00

No. 123: 20.75-21.00

80-10-10 Ingot: 25.20

No. 305: 25.50

No. 315: 23.50

88-10-2 Ingot: 31.50

No. 210: 29.00

No. 245: 23.75-24.75

Yellow Ingot: 18.25-19.00

No. 405: 23.50

Manganese bronze: 18.25-19.00

No. 421: 18.25-19.00

Aluminum Ingot

(Cents per lb, of 30,000 lb)

95-5 aluminum-silicon alloys: 20.00-20.25

0.30 copper, max: 19.75-20.25

0.60 copper, max: 19.75-20.25

Piston alloys (No. 122 type): 18.50-19.00

No. 12 alum. (No. 2 grade): 17.75-18.25

108 alloy: 18.50-19.00

195 alloy: 19.50-20.00

13 alloy: 20.00-20.25

AXS-679: 18.50-19.00

Steel deoxidizing aluminum, notch-bar granulated or shot: 19.25-19.50

Grade 1—95-97 1/2: 19.25-19.50

Grade 2—92-95 1/2: 18.25-18.50

Grade 3—90-92 1/2: 17.25-17.50

Grade 4—85-90 1/2: 16.75-17.00

Steel deoxidizing aluminum, notch-bar granulated or shot: 19.25-19.50

Grade 1—95-97 1/2: 19.25-19.50

Grade 2—92-95 1/2: 18.25-18.50

Grade 3—90-92 1/2: 17.25-17.50

Grade 4—85-90 1/2: 16.75-17.00

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper: 39 1/2

Electrodeposited: 33 1/2

Rolled, oval, straight, delivered: 36.55

Forged ball anodes: 41

Brass, 80-20: 32 1/2

Cast, oval, 15 in. or longer: 22 1/2

Ball anodes: 21 1/2

Nickel 90 pct plus: 68.00

Rolled, depolarized: 69.00

Cadmium: \$2.30

Silver 999 fine, rolled, 100 oz lots, per oz per troy oz, f.o.b. Bridgeport, Conn.: 79 1/2

Chemicals (Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum: 49 1/2

Copper sulfate, 99.5 crystals, bbl: 10 1/2

Nickel salts, single or double, 4-100 lb bags, frt allowed: 20 1/2

Nickel chloride, 375 lb drum: 27 1/2

Silver cyanide, 100 oz lots, per oz: 61 1/2

Sodium cyanide, 96 pct domestic 200 lb drums: 19.25

Zinc sulfate, 99 pct granular: 7.15

Zinc cyanide, 100 lb drums: 43 1/2

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

Heavy

Turnings

Copper 19 1/2

Yellow brass 18 1/2

Red brass 18 1/2

Commercial bronze 18 1/2

Manganese bronze 16 1/2

Leaded brass rod ends 16 1/2

Aluminum 18 1/2

Mixed old cast 18 1/2

Mixed old clips 18 1/2

Mixed turnings, dry 18 1/2

Pots and pans 18 1/2

Radiators 18 1/2

*Dry copper content.

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire 19.50

No. 2 copper wire 18.50

Light copper 17.50

No. 1 composition 15.50-16.00

No. 1 comp turnings 15.00-15.50

Rolled brass 13.50

Brass pipe 15.00

Radiators 13.00-13.25

Heavy yellow brass 11.75-12.00

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire 19.50

No. 2 copper wire 18.50

Light copper 17.50

No. 1 composition 15.50-16.00

No. 1 composition turnings 15.00-15.50

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	June 27, June 20, May 30, June 28,	(cents per pound)	1950	1950	1950	1949
Hot-rolled sheets	3.35	3.35	3.35	3.25		
Cold-rolled sheets	4.10	4.10	4.10	4.00		
Galvanized sheets (10 ga.)	4.40	4.40	4.40	4.40		
Hot-rolled strip	3.25	3.25	3.25	3.25		
Cold-rolled strip	4.21	4.21	4.21	4.038		
Plate	3.50	3.50	3.50	3.40		
Plates wrought iron	7.85	7.85	7.85	7.85		
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25		

Tin and Terneplate:

	(dollars per base box)				
Tinplate (1.50 lb) cokes.	\$7.50	\$7.50	\$7.50	\$7.75	
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70	
Special coated mfg. ternes	6.35	6.35	6.35	6.65	

Bars and Shapes:

	(cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35	
Cold-finished bars	4.145	4.145	4.145	3.995	
Alloy bars	3.95	3.95	3.95	3.75	
Structural shapes	3.40	3.40	3.40	3.25	
Stainless bars (No. 302)	28.50	28.50	28.50	28.50	
Wrought iron bars	9.50	9.50	9.50	9.50	

Wire:

	(cents per pound)				
Bright wire	4.50	4.50	4.50	4.15	

Rails:

	(dollars per 100 lb)				
Heavy rails	\$3.40	\$3.40	\$3.40	\$3.20	
Light rails	3.75	3.75	3.75	3.55	

Semi-finished Steel:

	(dollars per net ton)				
Rerolling billets	\$54.00	\$54.00	\$54.00	\$52.00	
Slabs, rerolling	54.00	54.00	54.00	52.00	
Forging billets	63.00	63.00	63.00	61.00	
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00	

Wire Rod and Skelp:

	(cents per pound)				
Wire rods	3.85	3.85	3.85	3.40	
Skelp	3.15	3.15	3.15	3.25	

Price advances over previous week are printed in Heavy Type; declines appear in Italic.

Pig Iron:	June 27, June 20, May 30, June 28,	(per gross ton)	1950	1950	1950	1949
No. 2, foundry, Phila.	\$50.42	\$50.42	\$50.42	\$50.56		
No. 2, Valley furnace	46.50	46.50	46.50	46.50		
No. 2, Southern Cin'ti	49.08	49.08	49.08	45.47		
No. 2, Birmingham	42.38	42.38	42.38	39.38		
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50		
Basic del'd Philadelphia	49.92	49.92	49.92	49.74		
Basic, Valley furnace	46.00	46.00	46.00	46.00		
Malleable, Chicago†	46.50	46.50	46.50	46.50		
Malleable, Valley	46.50	46.50	46.50	46.50		
Charcoal, Chicago	68.56	68.56	68.56	73.78		
Ferromanganese‡	173.40	173.40	173.40	173.40		

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡Average of U. S. prices quoted on Ferroalloy page.

Scrap:

Scrap:	(per gross ton)				
Heavy melt'g steel, P'gh.	\$41.75	\$44.75	\$42.25	\$20.75	
Heavy melt'g steel, Phila.	33.75	33.75	32.00	17.50	
Heavy melt'g steel, Ch'go	37.50	38.50	37.50	19.75	
No. 1 hy. com. sh't, Det.	37.50	39.50	39.50	13.75	
Low phos. Young'n	44.25	45.25	45.75	21.25	
No. 1 cast, Pittsburgh	43.75	43.75	42.75	26.50	
No. 1 cast, Philadelphia	39.50	39.50	38.50	27.50	
No. 1 cast, Chicago	45.50	46.50	47.50	29.50	

Coke: Connellsville:

Coke: Connellsville:	(per net ton at oven)				
Furnace coke, prompt	\$14.25	\$14.25	\$14.25	\$14.25	
Foundry coke, prompt	16.25	16.25	16.25	16.25	

Nonferrous Metals:

Nonferrous Metals:	(cents per pound to large buyers)				
Copper, electro, Conn.	22.50	22.50	20.50	16.00	
Copper, Lake, Conn.	22.625	22.625	20.625	18.625	
Tin, Straits, New York	78.50†	76.75*	76.50	\$1.03	
Zinc, East St. Louis	15.00	15.00	12.50	9.00	
Lead, St. Louis	11.30	11.80	11.80	11.85	
Aluminum, virgin	17.50	17.50	17.50	17.00	
Nickel, electrolytic	51.22	51.22	42.97	42.93	
Magnesium, ingot	21.50	21.50	20.50	20.50	
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50	

*Tentative. †Revised.

[Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)]

Pig Iron

Pig Iron	\$46.38 per gross ton....	\$37.67 per gross ton....
....46.38 per gross ton....	....39.00 per gross ton....	
....46.38 per gross ton....	....37.25 per gross ton....	
....45.91 per gross ton....	....19.33 per gross ton....	

Scrap Steel

Scrap Steel	\$22.00 per gross ton....	\$19.17 per gross ton....
....22.00 per gross ton....	....21.83 per gross ton....	
....22.00 per gross ton....	....22.50 per gross ton....	

High	Low	High	Low
\$46.38 Feb. 7	\$45.88 Jan. 3	\$40.92 June 6	\$26.25 Jan. 3
46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10
23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

28
19
56
50
47
38
50
74
00
50
50
78
40
Chi-

MARKETS—PRICES—TRENDS



SCRAP

Iron & Steel

Pittsburgh Mill Embargoes Slow Market

Pittsburgh mills were flooded with scrap brought out by higher prices. Hot weather and coming vacations may cause smaller output from mills and foundries. Widespread embargoes have been placed on incoming scrap by some Pittsburgh mills.

These factors are all resulting in a very quiet market.

Prices on steelmaking grades of scrap are either unchanged or down slightly in all markets. Cast grades are similarly affected and borings and turnings are relatively quiet. Chemical borings are continuing strong in New York, Boston, and Philadelphia.

The unusual price spreads in No. 1 steel and between No. 1 and No. 2 grades are gradually evaporating as a result of the slower moving market tendencies.

PITTSBURGH—The flood of scrap brought out by higher prices has forced four district mills to suspend or curtail shipments. One mill barely averted an embargo on all incoming raw materials shipments before it succeeded in stemming the tide. Until this jam eases, the mills are not even remotely interested in new purchases. As a result, dealers are said to be offering tonnages to brokers

for as low as \$40.00, though not in good tonnages. What a mill could buy for now, assuming it were interested, is anybody's guess. Certainly the market was softer. In the absence of significant new consumer commitments and their temporary inability to even consider additional purchases, and taking into consideration the reported broker-dealer exchanges, the price of No. 1 heavy melting is off \$3.00 to \$42.00, top.

CHICAGO—The price of No. 1 heavy melting steel in the Chicago area this week was off \$1.00 per gross ton following the announcement last week of a mill order at \$38.00. On the same order No. 2 heavy melting was bought for \$36.00 per gross ton. Another mill in the area bought No. 1 for \$37.50 this week. The market is holding fairly steady at last mill prices. Cast grades were off \$1.00 to \$2.00 because of reduced foundry operations during the summer months.

PHILADELPHIA—The scrap market was unchanged here last week. There were conflicting market factors at work, creating some confusion in market psychology. No new orders had been placed, but shipments on old orders are steadily moving to the mills. Reports of widespread embargoes by Pittsburgh mills have had a weakening influence, as well as approaching hot weather and vacation periods. The new war in the Far East adds a note of tenseness to the market. Dealers report it difficult to get orders at quoted prices. Navy Yard turnings are reported to have brought \$25.00 in Philadelphia.

NEW YORK—With the mills overflowing with scrap and the expected reduction

in production because of coming vacations very little scrap is flowing from this market to Pittsburgh. Price trends are generally downward except in certain cast grades and chemical borings which are continuing strong.

DETROIT—The market is noticeably weaker here this week and prices are down \$2.00 to \$3.00 per ton for most grades. Mills are resisting present high prices and reports of holdups on scrap shipments have helped to confirm reports that the market has eased substantially from the peak reached several weeks ago. Big industrial lists which will be sold this week are expected to bring \$3.00 to \$5.00 per ton less than sales a month ago.

CLEVELAND—The market continued soft both here and in the Valley. In the absence of mill buying, it was difficult to pinpoint the current going price. However, on the basis of broker-dealer activity and brokers offering prices, the market was off \$1.00 from last week. Mill inventories were reported good, and it was believed there would be little significant activity for most of July. One large Valley consumer was reported holding up shipments, while another is scheduling shipments to relieve congested unloading and inspecting facilities.

ST. LOUIS—The scrap situation has eased somewhat in the St. Louis industrial district as a result of offerings from other markets and the failure of one large consumer to buy anything during June, which made it easier for others to get supplies. However, there is still said to be a strong undertone to the market as buying by the mills is expected to be resumed after the Fourth of July. While No. 2 heavy melting is off \$1.00 there is no change in No. 1 because of a better demand.

CINCINNATI—No. 1 heavy melting steel held firm at \$37.00 top, but some other grades were off \$1.00. Heavy breakable cast dropped \$3.00. The market was at a virtual standstill and, with the mills heavy on inventories, little activity was expected for several weeks, at least. Vacation shutdowns are having a bearish effect on both openhearth and foundry grades, according to brokers here.

BOSTON—The \$2.00 spread on No. 1 heavy melting steel has narrowed to 50¢ with No. 1 selling for \$28.50 to \$29.50. The same happened to No. 1 bundles. Cast grades remained the same and there was a slight reshuffling of turnings and borings prices. On the whole the market here is very quiet.

BIRMINGHAM—The scrap market is at a standstill here and prices are steady and unchanged since last week. Brokers are sitting tight waiting to see what the situation will be after the Fourth of July holiday. Steel mills, foundries and other users are expected to start buying again early next month when the big supply purchased early in June is worked down more.

BUFFALO—Scrap prices slipped another dollar as dealers failed to see any bullish price aspects in the communist invasion of Korea. Mills refused to show any buying interest even at the lower prices. Viewing the war threat with restraint, dealers pointed out that even if there were a widespread conflict, scrap prices would be one of the first to be placed under government regulations—and they would be lower than those prevailing.

Iron and Steel

Pittsburgh

No. 1 hvy. melting	\$41.50 to \$42.00
No. 2 hvy. melting	35.50 to 36.00
No. 1 bundles	41.50 to 42.00
No. 2 bundles	33.50 to 34.00
Machine shop turn.	30.50 to 31.00
Mixed bor. and ms. turns	30.50 to 31.00
Shoveling turnings	34.50 to 35.00
Cast iron borings	33.50 to 34.00
Low phos. plate	45.00 to 45.50
Heavy turnings	39.00 to 40.00
No. 1 RR. hvy. melting	46.50 to 47.00
Scrap rails, random lgth.	44.00 to 44.50
Rails 2 ft and under	47.50 to 48.50
RR. steel wheels	48.50 to 49.00
RR. spring steel	48.50 to 49.00
RR. couplers and knuckles	48.50 to 49.00
No. 1 machinery cast	43.50 to 44.00
Mixed yard cast	38.00 to 38.50
Heavy breakable cast	35.00 to 36.00
Malleable	44.00 to 45.00

Chicago

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 factory bundles	37.00 to 38.00
No. 1 dealers' bundles	37.00 to 38.00
No. 2 dealers' bundles	32.00 to 33.00
Machine shop turn.	24.50 to 25.50
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	41.00 to 42.00
Low phos. plate	39.00 to 40.00
No. 1 RR. hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	49.00 to 50.00
Rails 2 ft and under	47.00 to 48.00
Locomotive tires, cut	44.00 to 45.00
Cut bolsters & side frames	40.00 to 41.00
Angles and splice bars	45.00 to 46.00
RR. steel car axles	57.00 to 58.00
RR. couplers and knuckles	44.50 to 45.50
No. 1 machinery cast	45.00 to 46.00
No. 1 agric. cast	43.00 to 44.00
Heavy breakable cast	37.00 to 38.00
RR. grade bars	36.00 to 37.00
Cast iron brake shoes	36.00 to 37.00
Cast iron car wheels	41.50 to 42.50
Malleable	47.00 to 48.00

Philadelphia

No. 1 hvy. melting	\$33.50 to \$34.00
No. 2 hvy. melting	30.50 to 31.50
No. 1 bundles	33.50 to 34.50
No. 2 bundles	27.00 to 28.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	25.00 to 26.00
Low phos. punchings, plate	37.00 to 38.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. bundles	34.00 to 35.00
Hvy. axle forge turn.	33.50 to 34.50
Clean cast chem. borings	33.00 to 34.00
RR. steel wheels	39.00 to 40.00
RR. spring steel	39.00 to 40.00
Rails 18 in. and under	41.00 to 42.00
No. 1 machinery cast	39.00 to 40.00
Mixed yard cast	34.00 to 35.00
Heavy breakable cast	35.00 to 36.00
Cast iron carwheels	40.00 to 41.00
Malleable	42.00 to 43.00

Cleveland

No. 1 hvy. melting	\$39.50 to \$40.00
No. 2 hvy. melting	34.50 to 35.00
No. 1 busheling	39.50 to 40.00
No. 1 bundles	39.50 to 40.00
No. 2 bundles	29.50 to 30.00
Machine shop turn.	25.50 to 26.00
Mixed bor. and turn.	28.50 to 29.00
Shoveling turnings	28.50 to 29.00
Cast iron borings	28.50 to 29.00
Low phos. 2 ft and under	41.50 to 42.00
Steel axle turn.	39.50 to 40.00
Drop forge flashings	40.50 to 41.00
No. 1 RR. hvy. melting	45.00 to 45.50
Rails 3 ft and under	48.00 to 49.00
Rails 18 in. and under	49.00 to 50.00
No. 1 machinery cast	46.00 to 47.00
RR. cast	46.00 to 47.00
RR. grade bars	34.00 to 35.00
Stove plate	38.00 to 39.00
Malleable	44.00 to 45.00

Youngstown

No. 1 hvy. melting	\$42.00 to \$42.50
No. 2 hvy. melting	37.00 to 37.50
No. 1 bundles	42.00 to 42.50

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$32.50 to \$33.00
Machine shop turn.	32.00 to 32.50
Shoveling turnings	34.00 to 34.50
Cast iron borings	34.00 to 34.50
Low phos. plate	44.00 to 44.50

Buffalo

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 busheling	35.00 to 36.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	29.00 to 30.00
Low phos. plate	41.00 to 42.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	45.00 to 47.00
RR. steel wheels	42.00 to 43.00
RR. spring steel	42.00 to 43.00
RR. couplers and knuckles	42.00 to 43.00
No. 1 machinery cast	37.00 to 38.00
No. 1 cupola cast	34.00 to 35.00
Stove plate	36.00 to 37.00
Small Indus. malleable	37.00 to 38.00

Birmingham

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	37.00 to 38.00
Structural and plate	36.00 to 37.00
Scrap rails, random lgth.	35.00 to 36.00
Rerolling rails	44.00 to 45.00
Rails 2 ft and under	44.00 to 45.00
Angles and splice bars	40.00 to 41.00
Std. steel axles	34.00 to 35.00
No. 1 cupola cast	38.00 to 39.00
Stove plate	33.00 to 34.00
Cast iron carwheels	33.00 to 34.00

St. Louis

No. 1 hvy. melting	\$38.00 to \$40.00
No. 2 hvy. melting	32.00 to 33.00
No. 2 bundled sheets	32.00 to 33.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	25.00 to 26.00
Rails, random lengths	40.00 to 41.00
Rails 3 ft and under	46.00 to 47.00
Locomotive tires, uncut	41.00 to 42.00
Angles and splice bars	45.00 to 46.00
Std. steel car axles	52.00 to 53.00
RR. spring steel	42.00 to 43.00
No. 1 machinery cast	40.00 to 42.00
Hvy. breakable cast	37.00 to 39.00
Cast iron brake shoes	36.00 to 38.00
Stove plate	36.00 to 37.00
Cast iron car wheels	39.00 to 40.00
Malleable	44.00 to 45.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	26.00 to 27.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	18.50 to 19.00
Mixed bor. and turn.	18.50 to 19.00
Shoveling turnings	20.00 to 20.50
Clean cast chem. bor.	28.00 to 29.00
No. 1 machinery cast	31.00 to 32.00
Mixed yard cast	29.00 to 29.50
Charging box cast	29.00 to 29.50
Heavy breakable cast	29.50 to 30.00
Unstrp. motor blocks	22.00 to 22.50

Boston

No. 1 hvy. melting	\$28.50 to \$29.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 bundles	28.50 to 29.00

No. 2 bundles	\$22.00 to \$23.00
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	18.00 to 18.50
Shoveling turnings	19.50 to 20.00
No. 1 busheling	28.00 to 29.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast	31.00 to 32.00
No. 2 machinery cast	28.00 to 29.00
Heavy breakable cast	25.00 to 26.00
Stove plate	25.00 to 26.00

Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 bundles	37.00 to 38.00
New busheling	35.00 to 36.00
Flashings	32.00 to 33.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. plate	36.00 to 37.00
No. 1 cupola cast	40.00 to 41.00
Heavy breakable cast	31.00 to 32.00
Stove plate	34.00 to 35.00
Automotive cast	43.00 to 44.00

Cincinnati

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$36.50 to 37.00
No. 2 hvy. melting	30.50 to 31.00
No. 1 bundles	36.50 to 37.00
No. 2 bundles, black	29.50 to 30.00
No. 2 bundles, mixed	25.50 to 26.00
Machine shop turn.	20.50 to 21.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Low phos. 18 in. under	46.00 to 47.00
Rails, random lengths	41.50 to 42.00
Rails, 18 in. and under	49.00 to 50.00
No. 1 cupola cast	46.00 to 47.00
Hvy. breakable cast	35.50 to 36.00
Drop broken cast	48.00 to 49.00

San Francisco

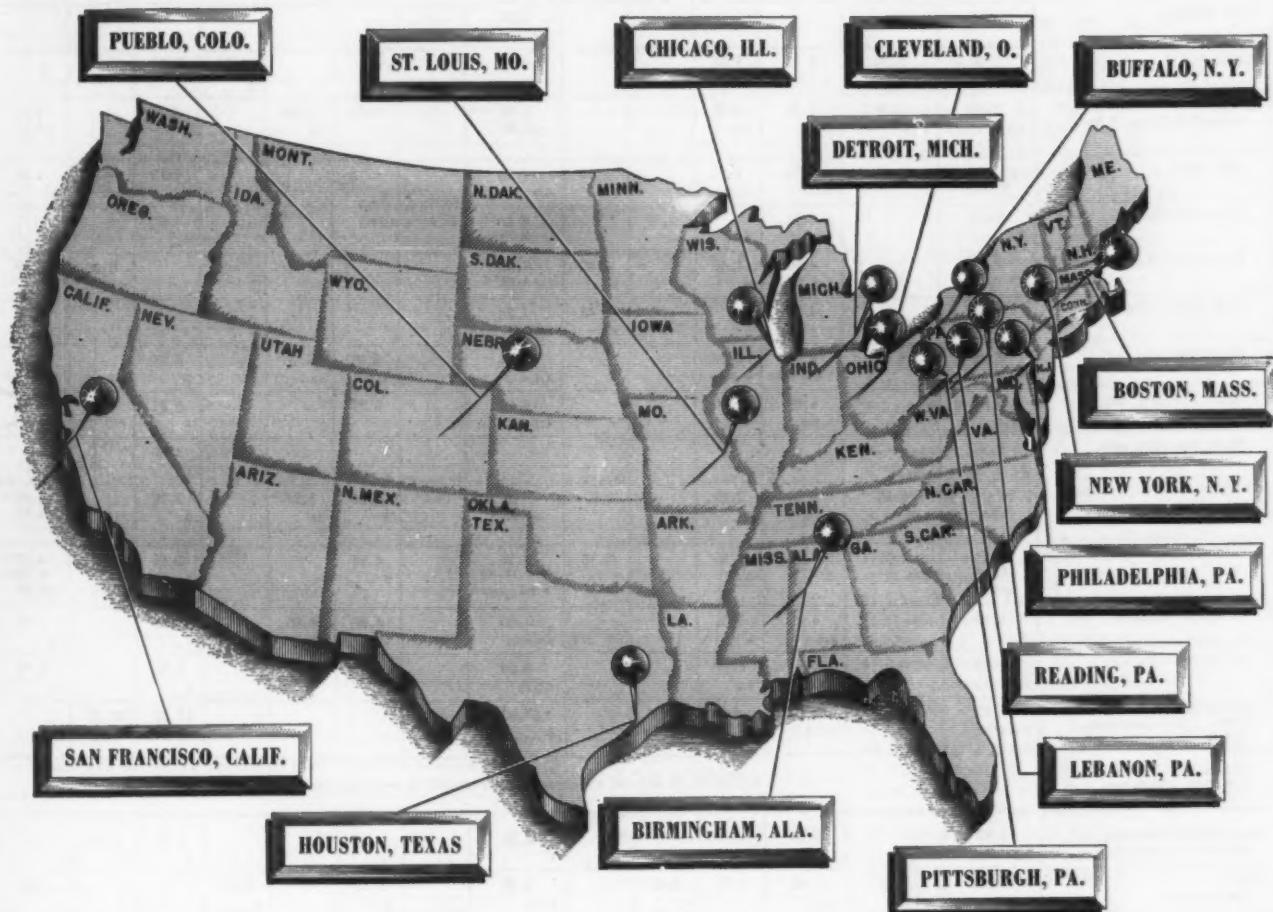
F.o.b. Calif. shipping point:	
No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	20.00
No. 1 bundles	22.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	22.00
Scrap rails, random lgth.	22.00
No. 1 cupola cast	\$32.50 to 34.00

Seattle

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	20.00
No. 1 bundles	18.00
No. 2 bundles	18.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	\$50.00													\$50.00
Alley, net ton	\$51.00 1.17													\$51.00 1.17
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	\$53.00 1	\$53.00 1	\$53.00 1				\$57.00 18		\$53.00 8	\$58.00 16	\$53.00 8			
Carbon forging billets, net ton	\$63.00 1	\$63.00 1.4	\$63.00 1.8	\$63.00 4			\$63.00 26		\$63.00 8.4	\$65.00 26	\$63.00 8			\$66.00 81
Alley, net ton	\$66.00 1.17	\$66.00 1.4	\$66.00 1		\$66.00 4.42		\$66.00 18	\$66.00 8	\$66.00 2.4	\$68.00 26	\$66.00 8			\$66.00 81
PIPE SKELP	3.15 1						3.15 1.4							
WIRE RODS	3.85 2.16	3.85 3.43	3.85 6	3.85 2			3.85 8				3.85 8	3.95 8		
SHEETS Hot-rolled (18 ga. & hr.)	3.35 1.5.9.15	3.35 28	3.35 1.6.8	3.35 4.5			3.35 ^{1.4.6} 18.50		3.35 8	3.45 26		3.35 8		3.55 ^{1.2} 4.15
Cold-rolled	4.10 ^{1.5.7.9.15} 5.10 ₄₁		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 8			4.10 8	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.65 ⁶ 4.75 ⁴					4.40 8		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40 ⁶ 4.90 ^{7.8}						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 84							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.15		5.05 8	5.05 26		5.05 8		5.25 12
Hi str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.15		6.20 8			6.20 8		6.40 12
Hi str. low alloy, galv.	6.75 1											6.75 8		
STRIP Hot-rolled	3.25 ^{1.7.9.15} 3.50 ₄₁	3.25 8.68	3.25 1.6.8	3.25 5			3.25 ^{1.4.6} 18.50		3.25 8	3.35 26		3.25 8		3.45 ^{1.2} 4.05
Cold-rolled	4.15 ^{1.5.7.9} 4.50 _{4.50}	4.30 8.68	4.30 8	4.15 2.5		4.15 7	4.15 ⁶ 4.65 ^{4.40} 4.50 ^{15.40}		4.15 8			4.15 8		4.35 ^{1.2} 4.75 ⁸ 4.95
Hi str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.15		4.95 8	4.95 26		4.95 8		5.15 12
Hi Str. low alloy, c.r.	6.20 8			6.20 2.5			6.20 4.6.15		6.40 8			6.40 8		6.40 12
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	\$7.50 1.5.9.15		\$7.50 1.6.8				\$7.50 4					\$7.00 8	\$7.70 22	

Electrolytic
0.25, 0.50, 0.75 lb box

Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price

BLACKPLATE, 28 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 8	5.50 22	
BARS Carbon steel	3.45 1.5.9	3.45 1.4.38	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 8.4		3.45 8			3.85 12
Reinforcing†	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 8.4		3.45 8			
Cold-finished	4.10 ⁴ 4.15 ^{2.4} 17.65.69.71	4.15 ³ 22.69.70	4.15 4.78.74	4.15 2.61	4.15 4.85.92		4.15 6.65.87		4.15 7.8					4.35 ^{1.2} 4.30 ⁸
Alley, hot-rolled	3.95 1.17	3.95 1.4.38	3.95 1.6.8	3.95 4	3.95 4		3.95 1.6.35	3.95 8	3.95 8.4		3.95 8			4.25 12
Alloy, cold-drawn	4.90 2.17.69.69.71	4.90 2.28.69.70	4.90 4.78.74	4.90 2.61	4.90 4.65.82		4.90 6.25.87	4.90 8	4.90 8.70					5.08 ⁴
Hi str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 8	5.20 8		5.20 8			5.40 12
PLATE Carbon steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.18		3.50 8	3.60 26	3.50 8	3.50 8		3.75 12
Floor Plates	4.55 1	4.55 8	4.55 5							4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 18			4.40 26		4.40 8		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.6.8	5.35 4.5			5.35 8			5.35 26	5.35 8	5.35 8		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.5.8	3.40 1.6.8					3.45 8	3.45 8		3.45 8			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.20 8	5.20 8		5.20 8			
MANUFACTURERS' WIRE Bright	4.50 2.5.18	4.50 ² 4.13.85.84		4.50 2.77			4.50 6	Kokomo=4.60 ²⁰		4.50 8	4.60 8	Duluth=4.50 ² Pueblo=4.75 ¹⁴		
PILING, Steel Sheet	4.20 ^{1.0} 1	4.20 1							4.20 8					

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras anoly.

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.					IRON AGE
Kansas City	Houston	Birm- ingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		STEEL PRICES
	\$80.00 ss				INGOTS Carbon forging, net ton
		\$53.00 11	F = \$72.00 ¹⁹		Alloy, net ton
	\$71.00 ss	\$63.00 11	F = \$82.00 ¹⁹	Geneva = \$63.00 ¹⁸	BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	\$74.00 ss		F = \$85.00 ¹⁹		Carbon forging billets, net ton
					Alloy net ton
					PIPE SKELP
	4.25 ss	3.85 11	SF = 4.50 ²⁴ LA = 4.65 ²⁴ .62	Portsmouth = 3.85 ¹⁸ Worcester = 4.15 ²	WIRE RODS
		3.35 4.11	SF, LA = 4.05 ²⁴ F = 4.25 ¹⁹	Ashland = 3.35 ⁷ Niles = 3.50 ²⁴	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10 11	SF = 5.05 ²⁴ F = 5.00 ¹⁹		Cold-rolled
		4.40 4.11	SF, LA = 5.15 ²⁴	Ashland = 4.40 ⁷ Kokomo = 4.50 ¹⁸	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F = 6.74 ¹⁹		Hi Str. low alloy, h.r.
			F = 7.05 ¹⁹		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 ss	3.85 ss	3.25 11	SF, LA = 4.00 ²⁴ .62 F = 4.40 ¹⁹ , S = 4.25 ²⁴	Ashland = 3.25 ⁷ Atlanta = 3.40 ¹⁸	STRIP Hot-rolled
			F = 5.40 ¹⁹ LA = 5.50 ²⁷	New Haven = 4.85 ⁷ , 5.00 ¹⁸	Cold-rolled
		4.95 11	F = 6.84 ¹⁹		Hi Str. low alloy, h.r.
			F = 6.95 ¹⁹		Hi Str. low alloy, c.r.
		7.00 11	SF = 11.25 ²⁴		
					TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Holloware enameling
4.05 ss	3.85 ss	3.45 4.11	SF, LA = 4.15 ²⁴ LA = 4.15 ²²	Atlanta = 3.60 ¹⁸	BARS Carbon steel
4.05 ss	3.85 ss	3.45 4.11	SF, S = 4.20 ²² F = 4.10 ¹⁹	Atlanta = 3.60 ¹⁸	Reinforcing:
				Putnam, Newark = 4.55 ¹⁸	Cold-finished
4.55 ss	4.35 ss		LA = 5.00 ²² F = 4.95 ¹⁹		Alloy, hot-rolled
				Newark ¹⁹ Worcester ² = 5.20 Hartford = 5.20 ¹	Alloy, cold-drawn
		5.20 11	F = 6.25 ¹⁹		Hi Str. low alloy, h.r.
3.90 ss	3.50 4.11		F = 4.10 ¹⁹ S = 4.40 ²² Geneva = 3.50 ¹⁸	Claymont = 3.80 ¹⁹ Coatesville = 3.60 ²¹ Harrisburg = 3.85 ²²	PLATE Carbon steel
				Harrisburg = 4.55 ¹⁸	Floor plates,
			F = 5.40 ¹⁹	Coatesville = 4.50 ²¹	Alloy
		5.35 11	F = 5.95 ¹⁹	Geneva = 5.35 ¹⁸	Hi Str. low alloy
4.00 ss	3.80 ss	3.40 11	SF = 3.95 ²² LA = 4.00 ²⁴ .62	Phoenixville = 3.30 ¹⁸ Geneva = 3.40 ¹⁶	SHAPES, Structural
		5.15 11	F = 4.00 ¹⁹ S = 4.05 ²²	Fontana = 5.75 ¹⁹ Geneva = 5.15 ¹⁶	Hi Str. low alloy
5.10 ss	4.90 ss	4.50 4.11	SF, LA = 5.45 ²⁴ .62	Portsmouth = 4.80 ¹⁹ Worcester = 4.80 ¹	MANUFACTURERS' WIRE Bright

Notes: *Special coated mfg terne deduct \$1.15 from 1.50-lb coke base box price.
Can-making quality blackplate, 55 to 128-lb, deduct \$1.90 from 1.50-lb coke base box.
†Straight lengths only from producer to fabricator.

IRON AGE

KEY TO STEEL PRODUCERS

With Principle Offices

- 1 Carnegie-Illinois Steel Corp., Pittsburgh
 2 American Steel & Wire Co., Cleveland
 3 Bethlehem Steel Co., Bethlehem
 4 Republic Steel Corp., Cleveland
 5 Jones & Laughlin Steel Corp., Pittsburgh
 6 Youngstown Sheet & Tube Co., Youngstown
 7 Armco Steel Corp., Middletown, Ohio
 8 Inland Steel Co., Chicago
 9 Weirton Steel Co., Weirton, W. Va.
 10 National Tube Co., Pittsburgh
 11 Tennessee Coal, Iron & R. R. Co., Birmingham
 12 Great Lakes Steel Corp., Detroit
 13 Sharon Steel Corp., Sharon, Pa.
 14 Colorado Fuel & Iron Corp., Denver
 15 Wheeling Steel Corp., Wheeling, W. Va.
 16 Geneva Steel Co., Salt Lake City
 17 Crucible Steel Co. of America, New York
 18 Pittsburgh Steel Co., Pittsburgh
 19 Kaiser Steel Corp., Oakland, Calif.
 20 Portsmouth Div., Detroit Steel Corp., Detroit
 21 Lukens Steel Co., Coatesville, Pa.
 22 Granite City Steel Co., Granite City, Ill.
 23 Wisconsin Steel Co., South Chicago, Ill.
 24. Columbia Steel Co., San Francisco
 25 Copperweld Steel Co., Glassport, Pa.
 26 Alan Wood Steel Co., Conshohocken, Pa.
 27 Calif. Cold Rolled Steel Corp., Los Angeles
 28 Allegheny Ludlum Steel Corp., Pittsburgh
 29 Worth Steel Co., Claymont, Del.
 30 Continental Steel Corp., Kokomo, Ind.
 31 Rotary Electric Steel Co., Detroit
 32 Laclede Steel Co., St. Louis
 33 Northwestern Steel & Wire Co., Sterling, Ill.
 34 Keystone Steel & Wire Co., Peoria, Ill.
 35 Central Iron & Steel Co., Harrisburg, Pa.
 36 Carpenter Steel Co., Reading, Pa.
 37 Eastern Stainless Steel Corp., Baltimore
 38 Washington Steel Corp., Washington, Pa.
 39 Jessop Steel Co., Washington, Pa.
 40 Blair Strip Steel Co., New Castle, Pa.
 41 Superior Steel Corp., Carnegie, Pa.
 42 Timken Steel & Tube Div., Canton, Ohio
 43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
 44 Reeves Steel & Mfg. Co., Dover, Ohio
 45 John A. Roebling's Sons Co., Trenton, N. J.
 46 Simonds Saw & Steel Co., Fitchburg, Mass.
 47 McLaughlin Steel Corp., Detroit
 48 Cold Metal Products Co., Youngstown
 49 Thomas Steel Co., Warren, Ohio
 50 Wilson Steel & Wire Co., Chicago
 51 Sweet's Steel Co., Williamsport, Pa.
 52 Superior Drawn Steel Co., Monaco, Pa.
 53 Tremont Nail Co., Wareham, Mass.
 54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
 55 Ingersoll Steel Div., Chicago
 56 Phoenix Iron & Steel Co., Phoenixville, Pa.
 57 Fitzsimmons Steel Co., Youngstown
 58 Stanley Works, New Britain, Conn.
 59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
 60 American Cladmetals Co., Carnegie, Pa.
 61 Cuyahoga Steel & Wire Co., Cleveland
 62 Bethlehem Pacific Coast Steel Corp., San Francisco
 63 Follansbee Steel Corp., Pittsburgh
 64 Niles Rolling Mill Co., Niles, Ohio
 65 Atlantic Steel Co., Atlanta
 66 Acme Steel Co., Chicago
 67 Joslyn Mfg. & Supply Co., Chicago
 68 Detroit Steel Corp., Detroit
 69 Wyckoff Steel Co., Pittsburgh
 70 Bliss & Laughlin, Inc., Harvey, Ill.
 71 Columbia Steel & Shaving Co., Pittsburgh
 72 Cumberland Steel Co., Cumberland, Md.
 73 La Salle Steel Co., Chicago
 74 Monarch Steel Co., Inc., Hammond, Ind.
 75 Empire Steel Co., Mansfield, Ohio
 76 Mahoning Valley Steel Co., Niles, Ohio
 77 Oliver Iron & Steel Co., Pittsburgh
 78 Pittsburgh Screw & Bolt Co., Pittsburgh
 79 Standard Forging Corp., Chicago
 80 Driver Harris Co., Harrison, N. J.
 81 Detroit Tube & Steel Div., Detroit
 82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
 83 Sheffield Steel Corp., Kansas City
 84 Plymouth Steel Co., Detroit

STAINLESS STEELS

Product	Base prices, in cents per pound, f.o.b. producing point									
	301	302	303	304	318	321	347	410	418	430
Ingots, rolling.....	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rolling.....	17.00	18.25	20.25	19.25	30.25	24.50	28.75	15.50	18.50	15.25
Forg. discs, die blocks, rings.....	30.50	30.50	33.00	32.00	49.00	38.50	41.00	24.50	25.00	28.00
Billets, forging.....	24.25	24.25	26.25	25.50	38.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals.....	28.50	28.50	31.00	30.00	48.00	34.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	28.50	28.50
Sheets.....	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled.....	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, Md., 37; Middlestown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 55; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N.Y., 46. Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N.J., 80; Youngstown, 48; Lockport, N.Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7; Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1; Munhall, Pa., 55; Bridgeville, Pa., 59; Dunkirk, N.Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N.Y., 17; Watervliet, N.Y., 28; Waukegan, Ill., 2; Lockport, N.Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67. Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N.J., 45; Harrison, N.J., 80; Baltimore, 7; Dunkirk, 28. Structural: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N.Y., 28; Bridgeport, Conn., 44. Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N.Y., 46; Middlestown, 7; Washington, Pa., 39; Cleveland, Massillon, 4. Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28. Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

Cents per lb.

Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Foliansbee, W. Va., 63; Granite City, Ill., 22*; add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

Base Column

Pittsburgh,

To dealers, f.o.b. mill	Calif.
Standard & coated nails*	106
Woven wire fence†	116
Fence posts, carloads††	116
Single loop bale ties...‡	113
Galvanized barbed wire**	126
Twisted barbless wire...‡	126
	146
	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

Base per Pittsburgh,

100 lb Calif.

Merch. wire annealed†	\$5.35	\$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads††	6.75	..
† Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.		
‡ Less 20¢ to jobbers.		
§ Torrance, 126.		

PRODUCING POINTS — Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Alquippa, Pa. (except bale ties), 5; Bartonsville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30;

Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburgh, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence Posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Wareham, Mass., 53.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier. No. 1 quality, per 100 lb. \$3.40

Joint bars, per 100 lb. 4.40

Light rails, per 100 lb. 3.75

Base Price

cents per lb

Track spikes†

Axles

Screw spikes

Tie plates

Pittsburg, Torr., Calif., Seattle... 4.35

Track bolts, untreated**

Track bolts, heat treated, to railroads**

** Minnequa, deduct 25¢. † Kansas City, 5.85¢.

PRODUCING POINTS—Standard rails: Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N.Y., 3; Minnequa, Colo., 14; Steelton, 3. Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, 3; Minnequa, 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N.Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N.Y., 3; Pittsburgh, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price about \$200.00 per net ton

Standard, T & C

Steel, Butt-weld*	Black	Galv
1/2-in.	40 1/2 to 38 1/2	21 to 19
3/4-in.	43 1/2 to 41 1/2	25 to 23
1-in.	46 to 44	28 to 26
1 1/4-in.	46 1/2 to 44 1/2	28 1/2 to 26 1/2
1 1/2-in.	47 to 45	29 to 27
2-in.	47 1/2 to 45 1/2	29 1/2 to 27 1/2
2 1/2 to 3-in.	48 to 46	30 to 28

Steel, lapweld

2-in.	38	19 1/2
2 1/2 to 3-in.	42	23 1/2
3 1/2 to 6-in.	43 to 40	24 1/2 to 21 1/2

Steel, seamless

2-in.	36	17 1/2
2 1/2 to 3-in.	39	20 1/2
3 1/2 to 6-in.	41	22 1/2

Wrought iron, butt-weld

1/2-in.	+26 1/2	+56
3/4-in.	+16 1/2	+45
1 & 1 1/4-in.	+10 1/2	+36
1 1/2-in.	+4 1/2	+32 1/2
2-in.	+4	+32

Wrought iron, lapweld

2-in.	+13 1/2	+40
2 1/2 to 3 1/2-in.	+11	+35 1/2
4-in.	+6	+29 1/2
4 1/2 to 8-in.	+8	+31
9 to 12-in.	+18	+40 1/2

Extra Strong, Plain Ends

Steel, butt-weld		
1/2-in.	39 1/2 to 37 1/2	21 1/2 to 19 1/2
3/4-in.	43 1/2 to 41 1/2	25 1/2 to 23 1/2
1-in.	45 1/2 to 43 1/2	28 1/2 to 26 1/2
1 1/4-in.	46 to 44	29 to 27
1 1/2-in.	46 1/2 to 44 1/2	29 1/2 to 27 1/2
2-in.	47 to 45	30 to 29
2 1/2 to 3-in.	47 1/2 to 45 1/2	30 1/2 to 28 1/2

Steel, seamless

2-in.	35	17 1/2
2 1/2 to 3-in.	38	21 1/2
3 1/2 to 6-in.	42 1/2	25

Wrought iron, butt-weld

2-in.	+22	+50
3/4-in.	+15 1/2	+43
1 to 2-in.	+5 1/2	+32

For threads only, butt-weld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt-weld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt-weld and lapweld steel pipe, jobbers are granted a discount of 5 pct. * Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD gage	Seamless	Electric	Weld	
In. BWG	H.R.	C.R.	H.R.	C.D.
2	13	\$20.61	\$24.24	\$19.99
2 1/2	12	27.71	32.58	26.88
3	12	30.82	36.27	31.60
3 1/2	11	38.52	45.38	35.18
4	10	47.82	56.25	43.99

Prices continued on next page

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS				
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore.....	5.15	6.39 ¹	6.55 ²	5.58-	....	6.04 ¹¹	5.89	5.79 ¹¹	8.19	8.69	9.99	11.12	11.49
Birmingham*	5.15 ¹⁰	6.95	....	5.59 ¹¹	....	5.40	5.25	5.10 ¹⁰	8.88	....	....	....	....
Boston.....	5.75	6.56 ¹⁰	6.94 ⁸	8.70	6.90-	6.08	5.75	5.60	6.19-	9.70-	8.50-	11.15	11.45	
Buffalo.....	5.15	5.95	6.94	5.41	7.27	5.65	5.35	5.15	5.75	9.60	9.90	11.05	11.35	
Chicago.....	5.15	5.95	6.85	5.10	6.80	5.40	5.25	5.10	5.65	9.25	9.65	10.70	11.00	
Cincinnati*	5.42-	5.99-	6.39	5.35	....	5.79-	5.64	5.35-	5.96-	9.60-	9.90-	11.05-	11.35-
Cleveland.....	5.67	6.24	7.14	6.95	....	5.79	5.64	5.54	6.25	9.51	10.11	11.26	11.56
Detroit.....	5.15	5.95	7.00-	5.24	6.38	5.52	5.37	5.12	5.75	9.36	9.66	10.81	11.11	
Houston.....	5.33	6.08	7.09	5.40	6.45-	5.79	5.64	5.39	5.91	9.56	9.86	11.01	11.31	
Indianapolis.....	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35-	10.50-	11.50	12.10
Kansas City.....	5.65	6.40	....	5.70	6.95	5.80	5.65	5.80	6.35	9.05	10.15	11.30	11.00
Los Angeles.....	5.90	7.45	7.60 ³	5.95	8.35 ¹⁴	6.00	5.90	5.90	7.55	10.75	10.75	12.45	12.75	
Memphis.....	5.93	6.68	....	8.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee.....	5.29	6.09	6.94-	5.24	6.32	5.64	5.39	5.24	5.88	9.39	9.69	10.84	11.14	
New Orleans*	5.50 ¹	6.85 ¹	....	5.55 ¹	6.90 ¹	5.65	5.55 ¹	5.55 ¹	6.75	....	....	....	....
New York.....	5.55-	6.54-	7.20 ²	5.84	6.76 ⁸	6.10	5.85	5.95	6.44	9.60	9.90	11.05	11.35	
Norfolk.....	5.65	6.64 ¹	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....
Philadelphia*	5.90	6.20	6.85 ²	5.65	6.29	5.45	5.25	5.50	6.21	9.35	9.65	10.80	11.10	
Pittsburgh.....	5.15	5.95	6.80	5.20	6.00	5.35	5.25	5.10	5.75	9.25	9.55	10.70	11.00	
Portland.....	6.80-	8.40 ²	....	8.85 ⁹	....	8.40 ⁹	8.50	8.45-	8.80 ¹⁴	12.00 ¹⁸	11.80 ¹⁸	....	....
Salt Lake City.....	5.85	6.70	....	7.45	8.75	8.10 ³	5.90	7.35 ⁸	8.75	....	....	....	....
San Francisco*	6.25 ¹¹	7.00 ²	7.65 ³	6.75 ¹¹	7.85 ¹⁴	6.15 ¹¹	6.00 ¹¹	6.15 ¹¹	7.55	10.75	10.75	12.45	12.75	
Seattle.....	6.60 ⁴	8.15 ²	8.40 ²	6.85 ⁴	....	6.35 ⁴	6.20 ⁴	6.35 ⁴	8.50 ¹⁴	....	11.60 ¹⁸	....	13.60 ¹⁸
St. Louis.....	5.48	6.28	7.18	5.43	6.68-	7.54	5.73	5.58	5.43	6.08	9.58	9.88	11.03	11.33
St. Paul*	5.71	6.51	7.41	5.66	6.18-	5.96	5.81	5.66	6.31	9.81	10.11	11.28	11.56	

BASE QUANTITIES: (Standard unless otherwise keyed on price.)

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	48.00	48.50	49.00	49.50	....	Boston.....	Everett.....	\$0.50 Arb.	....	50.50	51.00	....	60.90
Birmingham.....	41.88	42.38	42.80	43.30	....	Boston.....	Steeltown.....	6.90	....	52.79	53.29	53.79	....
Buffalo.....	48.00	48.50	47.00	47.50	....	Brooklyn.....	Bethlehem.....	4.29	48.58	49.08	....	....	....
Chicago.....	48.00	48.50	48.50	47.00	....	Cincinnati.....	Bethlehem.....	2.63	....	51.13	51.63	52.13	....
Cleveland.....	48.00	48.50	48.50	47.00	....	Jersey City.....	Bethlehem.....	7.70	53.70	54.20	....	....	....
Duluth.....	48.00	48.50	48.50	47.00	....	Los Angeles.....	Geneva-Ironton.....	3.33	49.33	49.83	49.83	50.33	54.33
Erie.....	48.00	48.50	48.50	47.00	....	Mansfield.....	Cleveland-Toledo.....	2.39	50.38	50.89	51.39	51.89	....
Granite City.....	47.90	48.40	48.90	49.50	....	Philadelphia.....	Bethlehem.....	1.44	49.44	49.94	50.44	50.94	....
Ironen, Utah.....	48.00	48.50	....	....	Philadelphia.....	Swedenland.....	3.09	....	....	....	57.09	....
Pittsburgh.....	46.00	48.50	46.50	47.00	....	Rochester.....	Buffalo.....	2.63	48.63	49.13	49.53	....	....
Geneva, Utah.....	46.00	48.50	....	....	San Francisco.....	Geneva-Ironton.....	7.70	53.70	54.20	....	....	....
Sharpsville.....	46.00	48.50	48.50	47.00	....	Seattle.....	Geneva-Ironton.....	7.70	53.70	54.20	....	....	....
Steeltown.....	48.00	48.50	49.00	49.50	54.00	St. Louis.....	Granite City.....	0.75 Arb.	48.65	49.15	49.65	....	....
Struthers, Ohio.....	46.00	....	....	....	Syracuse.....	Buffalo.....	3.58	49.58	50.08	50.58	....	....
Swedenland.....	48.00	48.50	49.00	49.50	....	....	....	....	....	....	....	....
Toledo.....	46.00	48.50	46.50	47.00	....	....	....	....	....	....	....	....
Troy, N. Y.....	48.00	48.50	49.00	....	54.00	....	....	....	....	....	....	....
Youngstown.....	48.00	48.50	48.50	47.00	....	....	....	....	....	....	....	....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 3¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese

content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—\$57.00; f.o.b. Buffalo, \$58.25. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, #6S-56. High phosphorus charcoal pig iron is not being produced.



PROPER DESIGN— still the most important ingredient

Despite the great advances in the use of alloy steels, the shape and proportions of a part are still of more vital significance than its material.

In an overall view, we should rate Design (1), the choice of the proper Steel (2), and its Treatment (3), in that order of importance. All are, of course, matters of great concern, but if the design is wrong then the proper choice of steel and its successful treatment serve no useful purpose.

What is the metallurgical significance of poor design? It promotes unhealthy stress concentrations and troublesome variations in the proportions of adjacent parts.

To stress the relationship of good design to metallurgical and economic factors, we have prepared a book helpful to designers, showing by sketches a great many factors in good and poor design which influence the behavior of a part in service.

Climax Molybdenum Company

500 Fifth Avenue
New York City

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MOLY

Continued

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List	Reg	Hvy	Lt
1/2 in. & smaller x 6 in. & shorter	27	38		
9/16 & 5/8 in. x 6 in. & shorter	29	40		
5/8 in. & larger x 6 in. & shorter	26	37		
All diam, longer than 6 in.	22	34		
Lag, all diam, longer than 6 in.	28	39		
Lag, all diam x 6 in. & shorter	30	41		
Plow bolts	40			

Nuts, Cold Punched or Hot Pressed

	(Hexagons or Square)	1/2 in. and smaller	25	37
9/16 to 5/8 in.		23	35	
5/8 to 1 1/8 in. inclusive		23	35	
1 1/8 in. and larger		16	29	

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List	Reg	Hvy	Lt
1/2 in. and smaller	41	35	41	
9/16 to 5/8 in.	36	30	36	
5/8 to 1 1/8 in.	31	27	33	
1 1/8 in. and larger	21	17	..	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

	(1/2 in. and larger)	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.		\$7.25

Small Rivets

	(7/16 in. and smaller)	Pct Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham		43

Cap and Set Screws

	Pet Off List
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 1/2 in. x 6 in., SAE 1020, bright	60
1/4 in. through 5/8 in. x 6 in. and shorter high C heat treated	54
Milled studs	23
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

	Base per pound f.o.b. mill
0.26 to 0.40 carbon	4.50¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

Per gross ton

Old range, bessemer	\$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in.	Length in.	Cents Per lb
17, 18, 20	60, 72	17.00¢
8 to 16	48, 60, 72	17.00¢
7	48, 60	18.64¢
6	48, 60	19.65¢
4, 5	40	20.48¢
3	40	21.53¢
2	24, 30	22.05¢
	24, 30	24.15¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)	*22.50	
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)	27.50	
Inconel-carbon		
10 pct, Coatesville (21)	36.00	
Monel-carbon		
10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)	75.00	
Aluminized steel sheets, hot dip, Butler, Pa. (7)	7.75	

* Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.00
18	4	1	—	5	\$1.55
18	4	2	—	—	\$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢
					57.5¢
					32¢
					29.5¢
					24.5¢
					21¢
					Warehouse prices on and east of Mississippi are 2 1/2¢ per lb higher. West of Mississippi, 4 1/2¢ higher.

COKE

Furnace, beehive (f.o.b. oven) Net Ton Connellsburg, Pa. \$14.00 to \$14.50

Foundry, beehive (f.o.b. oven) Connellsburg, Pa. \$16.00 to \$16.50

Foundry, oven coke

Buffalo, del'd	.... \$24.00
Chicago, f.o.b.	.... 21.00
Detroit, f.o.b.	.... 20.40
New England, del'd	.... 23.40
Seaboard, N. J., f.o.b.	.... 22.00
Philadelphia, f.o.b.	.... 21.25
Swedeland, Pa., f.o.b.	.... 21.20
Painesville, Ohio, f.o.b.	.... 21.90
Erie, del'd	.... \$21.04 to 21.25
Cleveland, del'd	.... 22.62
Cincinnati, del'd	.... 22.71
St. Paul, f.o.b.	.... 21.00
St. Louis, del'd	.... 22.18
Birmingham, del'd	.... 20.20

FLUORSPAR

Washed gravel fluor spar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net:

Effective CaF₂ content: 70% or more \$37.00

60% or less 34.00

IRON AGE MARKETS & PRICES
FOUNDED 1855

Continued

REFRACTORIES

(F.o.b. works)

	<i>Carloads, Per 1000</i>
Fire Clay Brick	
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5)	\$86.00
No. 1 Ohio	80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00	
No. 2 Ohio	72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$86.00
Childs, Pa.	90.00
Hays, Pa.	91.00
Chicago District	95.00
Western Utah and Calif.	101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago	106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	15.00
Silica cement, net ton, bulk, Hays, Pa.	17.00
Silica cement, net ton, bulk, Ensley, Ala.	16.00
Silica cement, net ton, bulk, Chi- cago District	16.00
Silica cement, net ton, bulk, Utah and Calif.	22.50

Chrome Brick

Per Net Ton

Standard chemically bonded, Balt., Chester	\$69.00
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Magnesite Brick

Standard, Baltimore	\$91.00
Chemically bonded, Baltimore	80.00

	<i>St. 3/8-in. grains</i>
Domestic, f.o.b. Baltimore,	
in bulk fines removed	\$56.00 to \$57.00
Domestic, f.o.b. Chewelah, Wash.,	
in bulk	33.00
in sacks	38.00

Dead Burned Dolomite

F.o.b. producing points in Pennsyl- vania, West Virginia and Ohio,	
per net ton, bulk Midwest, add	
10¢; Missouri Valley, add 20¢	\$12.25

METAL POWDERS

*Per pound, f.o.b. shipping point, in ton
lots, for minus 100 mesh.*

Swedish sponge iron c.i.f.	
New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd,	
East	10.00¢
Domestic sponge iron, 98+ %	
Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed,	
99.5+ % Fe	36.0¢ to 39.5¢
Electrolytic iron unannealed,	
minus 325 mesh, 99+ % Fe	48.5¢
Hydrogen reduced iron, mi-	
nus 300 mesh, 98+ % Fe.	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10	
micron, 98%, 99.8+ % Fe	70.0¢ to \$1.35
Aluminum	29.00¢
Brass, 10 ton lots	27.75¢ to 31.25¢
Copper, electrolytic	9.25¢ plus metal value
Copper, reduced	9.75¢ plus metal value
Cadmium, 100-199 lb	\$2.95
Chromium, electrolytic, 99%	
min. and quantity	\$3.50
Lead	18.50¢
Manganese	52.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	75.5¢
Nickel, annealed	8.15¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	20.50¢ to 23.85¢

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago	\$91.80 to \$95.30
6 to 24-in., del'd N. Y.	91.00 to 92.00
6 to 24-in., Birmingham	78.00 to 83.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	\$108.50 to \$113.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

Prices Continued on Next Page



HERC-ALLOY is America's first alloy steel chain. For slings or other applications HERC-ALLOY Chain will prove that efficiency, safety and economy can go hand-in-hand.

COLUMBUS MCKINNON
CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

SALES OFFICES: NEW YORK • CHICAGO • CLEVELAND • SAN FRANCISCO

Other Factories at Angola, New York, St. Catharines, Ontario and Johannesburg, S. A.

Continued

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Clairton, Pa.	\$175
\$2.00 for each 1% above 82% Mn. penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa. \$64.00	\$65.00
Pgh. or Chicago 65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn.	18.15¢
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Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.			
Carloads	Ton		
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.			
25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.			
Cast Turnings Distilled			
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

How continuously it works
is what counts

ILLUSTRATED HERE is a handling operation which is typical of the work some trucks perform throughout every shift . . . 24 hours a day! Under such circumstances every delay for servicing or repairs means lost time, lost income.



The logical truck for such work is an electric truck. Its motor drive stays on the job because it has few wearing parts . . . only one basic moving part.



The logical battery to power the truck is an EDISON Nickel-Iron-Alkaline Storage Battery. With steel cell construction inside and out, an electrolyte that is a preservative of steel, and a foolproof electrochemical principle of action, EDISON batteries are the longest-lived, most durable and most trouble-free of all.

EDISON batteries give you many advantages: they're mechanically durable; electrically foolproof; quickly and easily charged; simple to maintain; not injured by standing idle. Get a current EDISON price quotation—you will probably find initial cost MUCH LOWER than you think. Couple this factor with well-known EDISON long life and you will have the key to year-after-year economy.

EDISON
Nickel • Iron • Alkaline
STORAGE BATTERIES

EDISON STORAGE BATTERY DIVISION
of Thomas A. Edison, Incorporated, West Orange, N. J.
In Canada: International Equipment Co., Ltd., Montreal and Toronto

IRON AGE MARKETS & PRICES
FOUNDED 1855

Ferrochrome

Contract price, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.	(65-72% Cr, 2% max Si.)
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots.	97%
min. Cr, 1% max. Fe.	
0.20% Max. C.	\$1.09
0.50% max. C	1.05
.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)	
Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.	
Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.	

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

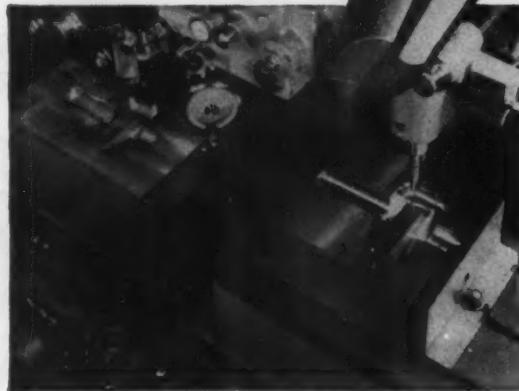
SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, $\frac{1}{4}$ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Prices Continued on Next Page

Turn out **MORE WORK** between grinds with **T-J CUTTER!**

*Less breakage...
Lower Cost!*



T-J Cutter at work on a Cincinnati 16" Vertical Hydrotel, latest design Die Sinker. A cutter of the right design and heat treatment for this high speed work in tough die steels, making possible the maximum efficiency of these new machines.

Your die costs go down... and you can raise the feed... using T-J Die Sinking Milling Cutters! Because of their advanced design, these cutters help you get the utmost in accuracy, speed and efficiency from your machines. T-J builds these sturdy cutters from a standard, extremely high grade steel... properly machined... scientifically heat-treated and accurately ground. They're extra rugged... hold a sharp edge longer... less breakage! Wide range of T-J standard styles and sizes saves time and money for you! Send for new catalog 150. The Tomkins-Johnson Co., Jackson, Michigan.

33 YEARS EXPERIENCE 
TOMKINS-JOHNSON
DIE SINKING MILLING CUTTERS

Continued

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.85
Ton lots	9.04
Calcium molybdate, 45-48%, f.o.b. Langlooth, Pa., per pound contained Mo	86
Ferrocolumbium, 50-50%, 2 in x D, contract basis, delivered, per pound contained Cb.	\$2.50
Ton lots	\$2.50
Less ton lots	3.55
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$2.67
Ferromolybdenum, 55-75%, f.o.b. Langlooth, Pa., per pound contained Mo	\$1.12
Ferrophosphorus, electrolytic, 25-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.40
Less ton lots	\$1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	\$167.00
Ferrotungsten, standard, lump or $\frac{1}{4}$ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdate oxide, briquets or cans, per lb contained Mo, f.o.b. Langlooth, Pa., bag, f.o.b. Washington, Pa., Langlooth, Pa.	95
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	94
Carload, bulk, lump	11.00
Ton lots, bulk, lump	11.50
Less ton lots, lump	12.25
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	\$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60
Boron Agents	
Contract prices per lb of alloy, del. Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45
Less ton lots, per pound	50
Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00
F.o.b. Wash., Pa.; 100 lb, up	
10 to 14% B .....	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93
No. 6	63
No. 79	45
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.46
Less ton lots	1.57
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00



Special high alloy, of course...to meet the exceptionally high temperatures encountered in jet engine operation.

Centrifugally cast...to provide the dense grain, uniform, clean castings required by the strict specifications.

Duraloy...because of the consistent excellence of castings turned out in our modern, technically controlled foundry. And note the machining! The center casting is a rough blank; the right and left castings are finished.

Why not let our metallurgists and foundrymen take care of your high alloy casting requirements, too?

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In Whitehead's large assortment of
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RE-NU-BILT GUARANTEED ELECTRIC POWER EQUIPMENT						
D.C. MOTORS						
Q.S.	H.P.	Make	Type	Volts	RPM	
1	1750	Whse.		600	550/700	
1	1500	Whse.		525	600	
2	1000	Whse.		450	600	
1	650	G. E.	MPC	230	115/145	
1	600	Al. Ch.		250	400/800	
1	600	G. E.	MPC	600	650	
1	600	Whse.		600	750/900	
1	500	Whse.		230	300/600	
1	325	Whse.	MQ	250	300/900	
1	200/300	G. E.	MPC	230	360/920	
1	275	Whse.	QM	230	425/850	
1	230	Al. Ch.		230	700	
1	250	G. E.	MPC	230	400/500	
1	150	G. E.		600	550/750	
1	150	Cr. Wh.	CCM	230	300/1050	
1	150	Cr. Wh.	65H	230	1150	
10	150	Cr. Wh.	83H-TEFC	230	960	
1	150	G. E.	MPC	230	250/450	
1	100	Rel.	1050T	230	400/1200	
1	100	G. E.	CD-175	230	365/730	
1	100/150	Whse.	SK-200	550	600	
1	125	El. Dy.	308	230	750/1500	
1	115	Cr. Wh.	JHL	230	1200	
1	50/100	G. E.	MPC	230	225/450	
3	100	Whse.	SK-184.5	230	475/950	
1	100	Whse.	SK	230	1200	
1	90	G. E.	CDM-1242-Z	115	1000	
1	75	Cr. Wh.	5H	230	860	
1	75	Whse.	SK-180L	115	650	
2	75	G. E.	CDM-1126-Y	230	2000	
1	75	Cr. Wh.	CMC-65H	230	500/1500	
1	60	El. Dy.	258	230	525/1050	
1	60	Whse.	SK	230	500/1000	
1	60	Whse.	SK-136	230	1600	
1	50	Cr. Wh.	CCM	230	1750	
1	50	El. Dy.	508	500	194/775	
1	50	Cr. Wh.	CMC-80H	230	380/750	
1	50	Cr. Wh.	CMC-81H	230	300/900	
2	40	G. E.	CD-1129	230	850/1275	
6	25/30	G. E.	CD-105	230	690/2070	
MILL & CRANE						
2	125	G. E.	CO-1832	230	825	
2	60	Whse.	Hoist	230	415	
2	50	Whse.	Hoist	230	415	
4	50	Whse.	Hoist	230	400	
2	30	K. E.	MD-104%AA	550	700	

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Slip Ring MOTORS

2—500 H.P. General Electric Type I form M, 3 ph. 60 cy. 2200 volt, 450 R.P.M.
1—400 H.P. Westinghouse, Type CW, 3 ph. 60 cy. 2200 volt, 514 R.P.M.
Each Complete with Primary Oil Switch and Magnetic Secondary Controllers.

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Before we remove them from present location.

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OVERHEAD CRANES & HOISTS

150-ton Morgan, 25-ton aux. 54'0" span, 230 volts D.C.
100-ton Morgan, 25-ton aux. 59'5" span, 230 V.D.C.
75-ton Morgan, 25-ton aux. 49'0" span, 230 V.D.C.
30-ton Cyclope, 5-ton aux. 50'0" span, 220/440/3/60 New 1943.
30-ton Shaw, 10-ton aux. 74'0" span, 230 V.D.C.
20-ton Alliance, 3 Meter 30'0" span, 230 V.D.C.
15-ton Leonard-Burke—span to suit, 220/440/3/60—Never used.
10-ton Shaw, 50'0" span—rebuild with D.C. or A.C. motors.
10-ton Harnischfeger, 70'0" span, 220/440/3/60 cyl. New 1941.
7½-ton Northern, 31'4" span, 220/3/60 F.I. Cont.
SEND FOR HOIST LIST
1000 to 10,000 lbs., D.C. or A.C., 1 or 2 motor.

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The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

New NISA Officers—H. E. Grant of Tennessee Electric Motor Service, Nashville, Tenn., was elected president of the National Industrial Service Assn. at its recent 17th annual convention held at the Boston Statler. Other officers elected for the ensuing year were: J. F. Ferrari, of Excel Electric Service Co., Chicago, vice-president; M. F. Zack of Zack Brothers Electric Co., Mason City, Iowa, secretary; and C. R. Durand of H. N. Crowder, Jr., Co., Allentown, Pa., treasurer.

NISA Directors Elected—The following NISA directors were elected to replace those whose terms had expired: Howard Lilly of Tampa Armature Works, Tampa, Fla.; Rudolph A. Scherer of Scherer Electric Co., Indianapolis; William M. Hogue, of Larsen-Hogue Electric Co., Los Angeles; and Hillrie Q. Griffith of Belyea Co., Jersey City.

New England Hospitality—The New England chapter was host to the 1950 NISA convention at Boston where approximately 500 members were in attendance. Chairmen Fred Ferris and Al Elson, Jr., welcomed the group and presided at the President's reception.

Guest speakers included: Alfred C. Neal, vice-president and director of research, Federal Reserve Bank of Boston; William S. Sutcliffe, dean of the College of Business Administration, Boston University; Col. Harold G. Hartman; and James I. Mehan, safety engineer and ex-governor of New Jersey.

Industry Problems—Papers presented by Association members covered current industry problems. They included: "Competent of Incompetent Competition"; "Basic Repair Shop Costing Practices"; "A Review of Rewind Times"; "Meters"; "Effects of the New Wage and Hour Law as Applied to

the Motor Repair Shop"; "Services of the Used Equipment Dealers"; "Rebirth of Selling"; "Silicones"; and "Job Classification."

Guided Tours—During the course of the convention, members participated in visits to manufacturer's and Boston NISA shops, and a guided tour through the Massachusetts Institute of Technology. Open forums were held during the last day of the convention on: "Management," "Sales Survey Reports," "Large and Small Motor Problems," "Overheat Protection," "Shop Methods," "Transformers," "Used Equipment," and "Office Procedure."

Machinery Demand—Used machinery demand in the Philadelphia district is still spotty. Buyers are looking for large items of equipment where major savings can be had in comparison with new machinery. Radial drills and horizontal and vertical boring mills can be sold as soon as they are acquired.

Demand is also active for sheet metal fabricating equipment such as large bed punch presses, press brakes, and bending shears, particularly if they were manufactured in the last 5 to 10 years.

Collet Business—Graff Machine Tool Co., who can furnish collets for nearly all automatics and screw machines regardless of age or type, are moving into larger quarters at 802 West Lake St., Chicago. The firm, originally built up during the war as a mail order business, is now expanding its activities to include the purchase and sale of used machine tools.

Next MDNA Convention—Chicago has been selected as the site of the 1950-1951 national convention of the Machinery Dealers National Assn. The date has been tentatively set for May 21-23, 1951.



Applies sales appeal to stainless steel ...Automatically

RICH, lustrous finishes . . . the silent salesmen that highlight customer preference for your products . . . are now produced automatically, using Osborn Power Brushes.

Shown above are typical cut and cold operations at the plant of a leading producer of polished and plated parts for the automotive and appliance industries. Trim parts formed from stainless steel are fed on an endless belt under rotating heads equipped with Osborn Buffbrushes* using abrasive compound. High finishes on these parts are mass produced with

a minimum of handling . . . at a minimum of cost.

When you polish stainless steel, cold rolled steel or other metal parts, an OBA (Osborn Brushing Analysis) may show you how to improve the quality of your work, increase your production and minimize rejects with power brushing. The services of the Osborn Brushing Analyst for all finishing and cleaning problems are backed by Osborn's extensive technical facilities and are yours for the asking. Simply write *The Osborn Manufacturing Company, Department*

294, 5401 Hamilton Avenue, Cleveland
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**CAN YOU IMPROVE YOUR FINISHES
AND CUT COSTS BY BRUSHING?**



LOOK FOR THE NAME



RECOGNIZED EVERYWHERE FOR

PROGRESS IN FINISHING METHODS



This zinc coating can take it!

Give Armco ZINCGRIP steel sheets a severe draw—tougher than you've ever imagined could be done on zinc-coated steel.

Then, if you've never worked with Drawing Quality ZINCGRIP before, you're due for a happy surprise. You'll find the special zinc coating stretches and "flows" in the dies. Fact is, the coating *takes as severe a draw as the iron or steel base without flaking or peeling.*

Think of the production savings with a mill-coated steel you can form or draw! And think of the

complete rust protection for your fabricated products and equipment—on sharp bends as well as flat parts.

Armco ZINCGRIP now has a record of more than 13 years in proved service. Created in 1936, ZINCGRIP was the *first* sheet steel hot-dip coated on a continuous production line.

ZINCGRIP is supplied in sheets or coils. For products to be painted, look into the many advantages of Armco ZINCGRIP-PAINTGRIP. This Bonderized zinc-coated steel takes and holds paint without pre-treatments of any kind.

ARMCO STEEL CORPORATION

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Joe MaGee
specifically recommends . . .



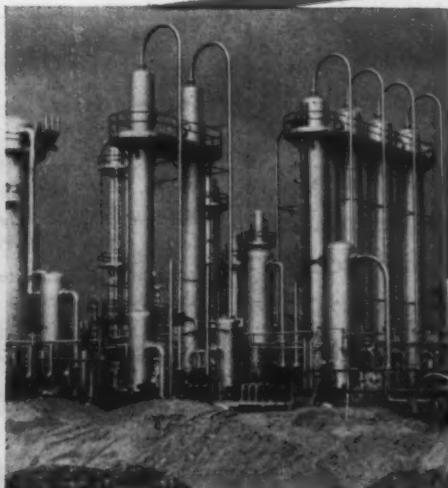
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W-2075 FOR MACHINABLE WELDS ON CAST IRON

Specifically developed (and recently improved) for making fully machinable welds on cast iron, W-2075 is a nickel-core rod that offers such operating advantages as:

1. Greater welding flexibility—either a-c or d-c, all positions.
2. Weld deposits are completely machinable and color matching.
3. Exceptionally stable arc—means smoother operation and weld deposits of machine-like appearance.
4. Increased resistance to cracking.
5. Excellent low-current operation—minimizes brittle heat-affected zone in base metal.

Try W-2075 on your own work and prove it to yourself. Call or write your G-E Welding Distributor for a sample order today.



TYPE W-32—AWS E6016 or E7016 a-c/d-c reverse polarity, all positions; a low-hydrogen electrode providing higher welding speeds, increased impact strength, and greater ductility. Eliminates under-bead cracking when welding medium-carbon steels, sulphur-bearing steels, etc.

TYPE W-2347—AWS 347-16, a-c/d-c reverse polarity, all positions. A stainless-steel electrode for welding AISI Types 302, 304, 308, and 347 stainless base metal. (For other special types of stainless, G.E. offers a complete line of stainless electrodes to match specific analyses.)

TYPE W-94—For building up or hard-surfacing areas requiring high abrasion and impact resistance, you can't beat W-94. It's an all-position rod especially suited to welding plowshares, hammer mills, scarifier teeth, tractor grousers, rock crushers, etc.



Let's Go Fishing

Big bass flashing through your fancy lately? Been hankering for cool pine groves . . . or the feel of rolling fairways underfoot?

Yes, it's vacation time again! And if you're planning a holiday, here's a suggestion that may help to keep things running smoothly while you're away.

Call Ryerson now for quick delivery of the steels likely to be needed before you return. And tell the men who carry on to get in touch with Ryerson for whatever steel they need.

You can depend on us to work closely with you and your men—to give prompt, personal

attention to every requirement. So take a breather—forget the shop—and enjoy your vacation to the full.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished

ALLOYS—Hot rolled, cold finished, heat treated

STRUCTURALS—Channels, angles, beams, etc.

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

PLATES—Many types including Inland 4-Way Safety Plate

REINFORCING—Bars & Accessories, spirals, wire mesh

SHEETS—Hot and cold rolled, many types & coatings

BABBITT—Glyco bearing metal, also Ryertex plastic bearings

TUBING—Seamless & welded, mechanical & boiler tubes

MACHINERY & TOOLS—for metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO



New Savings IN PRODUCTION DOLLARS

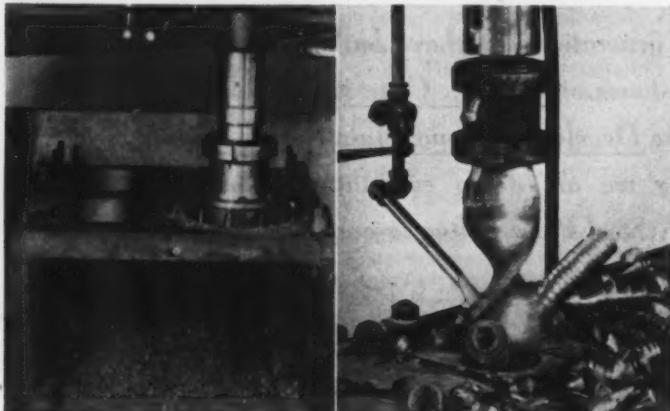
Track mounted—with equalized power clamping to the heavy rails—controlled by push buttons on head.

684 drilling operations on a Diesel Center Frame now completed in 17 hours—a 7-hour saving effected by this Cincinnati Bickford Super Service Radial.

"Easy Reach" levers—low on the head—control every operation from column clamping, speeds and feeds, to raising or lowering the arm.

These low controls save the operator steps, give him a clear view of the work, and increase his production.

Send for new Bulletin R-29 showing latest design features.



* Unusually long spindle sleeve bearing permits boring without .017" feet per revolution—it takes power.

Equal Efficiency of Every Unit Makes the Balanced Machine

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.

June 29, 1950



Radials 7½" dia. col., 2½" arm, to 26"
dia. col., 12" arm.
General purpose Uprights, 21" to
28" sizes.
Production Uprights, 21" to 28".
Jig Borers, Portable Horizontals,
Spacing Table Machines.



Our Customers'
GOODWILL

IS IMPORTANT TO US

For more than three generations, we have built our business upon the cornerstones of Quality, Courtesy, Personalized Service and the Development and Maintenance of Goodwill—that's why we are doing everything in our power to keep Worth Steel Plate rolling to our customers in this period of shortage.



FLANGED AND DISHED HEADS • CARBON AND STAINLESS-CLAD STEEL PLATES

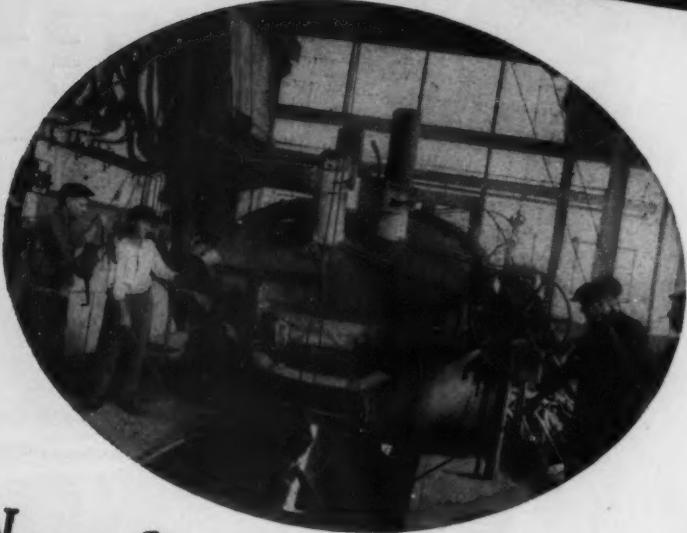
WORTH STEEL COMPANY • Claymont, Delaware

31

years ago:

McQuay-Norris

said . . .



No other Piston Ring has Metal like this

To improve on cupola-melted piston ring metal, the McQuay-Norris Manufacturing Company has changed all old established iron foundry practice. They have applied to piston ring manufacture the same method that has revolutionized the making of high-grade alloy steels—the Electric Furnace—the only one used in this country today for melting commercial gray iron. This improvement places McQuay-Norris Rings in still another class by themselves.

Written 31 years ago, that story is just as factual today: The accurate control possible with an electric furnace, the closer grain structure obtained at the higher temperatures, the greater uniformity possible; all result in better castings.

McQuay-Norris now has two Lectromelt Furnaces. That 3-ton furnace bought in 1919 has been modernized with Lectromelt electronic controls and other refinements. The second, installed in 1943, will do almost as much work as the old-timer although it's rated at half the capacity. It is top charged, rather than door charged.

If you're interested in learning what a Moore Rapid Lectromelt Furnace will do for you, write Pittsburgh Lectromelt Furnace Corporation, 312 32nd Street, Pittsburgh 30, Pennsylvania.

Manufactured in... CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2... ENGLAND: Birlec, Ltd., Birmingham... SWEDEN: Birlec Elektrognar A/B, Stockholm... AUSTRALIA: Birlec, Ltd., Sydney... FRANCE: Stein et Roubaix, Paris... BELGIUM: S. A. Belgo Stein et Roubaix, Bressoux-Liege... SPAIN: General Electrica Espanola, Bilbao... ITALY: Forni Stein, Genoa.

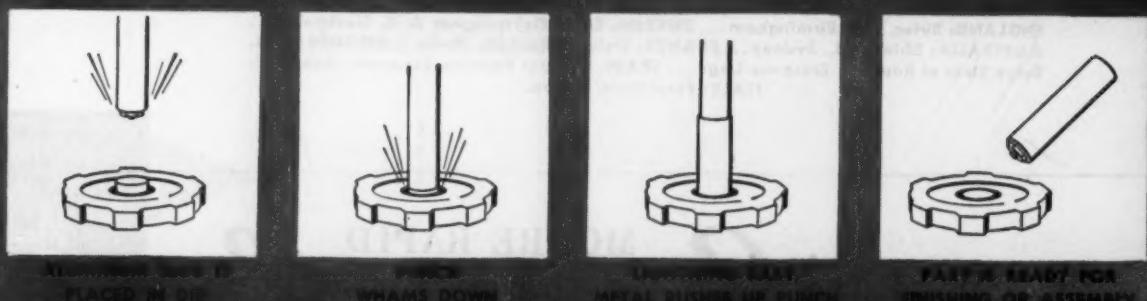
MOORE RAPID
WHEN YOU MELT... *Lectromelt*





An Alcoa Impact Extrusion forms the cylinder of this grease gun; costs less than drawn shell, is impact-extruded with octagonal nut at bottom, thus eliminating several secondary operations. Thick wall permits cutting threads at top of cylinder.

Here's what we mean by One-Punch Production





An arch like this takes extra strong brick

It takes rugged insulating fire brick to stand up on a job like this. That's why West Brothers Brick Company of Washington, D. C., selected Armstrong's A-26's for the "tailor-made" arch on their 90-foot-long, 21-foot-wide kilns.

High mechanical strength was essential so that the insulating brick would withstand the forces due to expansion during heating, as well as the thrust of the weight of the giant arch. The 325-pound-per-square-inch crushing strength of A-26 brick is well over that required to withstand those forces in this kiln. This high strength also guards against mechanical spalling due to the pinching action of the arch.

This kiln operates intermittently, and a rapid fan cooling method is used to speed the cycle. These two features impose a thermal shock on the brick that demands exceptionally high spalling resistance. Armstrong's A-26 Insulating Fire Brick take that shock without spalling loss.

Because each brick of this Armstrong's "Tailor-Made" Arch is factory-cut to exactly the

same size and taper for precision fit, it was possible to lay up the entire arch without cement.

The exact fit provides a more positive keying action with a structural stability that cannot be obtained when ordinary wedge and straight brick are used in arch construction.

Extra strength is one of the advantages you get with Armstrong's Insulating Fire Brick. But in the final analysis, brick performance depends on more than strength or any other one physical property. It takes a brick with all properties in good balance to give long and efficient service.

In Armstrong's complete line of six types of insulating fire brick, for temperatures from 1600° to 2800° F., you'll find each type possesses not only high strength but also light weight, high insulating efficiency, pyrochemical stability, and uniformity of size and composition as well.

For complete information on the physical properties of these better balanced brick, write today to Armstrong Cork Company, 4906 Mulberry St., Lancaster, Pa.



ARMSTRONG'S INSULATING REFRactories



Sand at your fingertips—mass production at its best. Production at a profit, too, with Jeffrey high-speed molding stations, mold conveyors, flask fillers, sand handling and conditioning equipment on the job. Single units or complete systems—give us a chance to make recommendations.

JEFFREY

ESTABLISHED 1877

Complete Line of
Material Handling,
Processing and
Mining Equipment

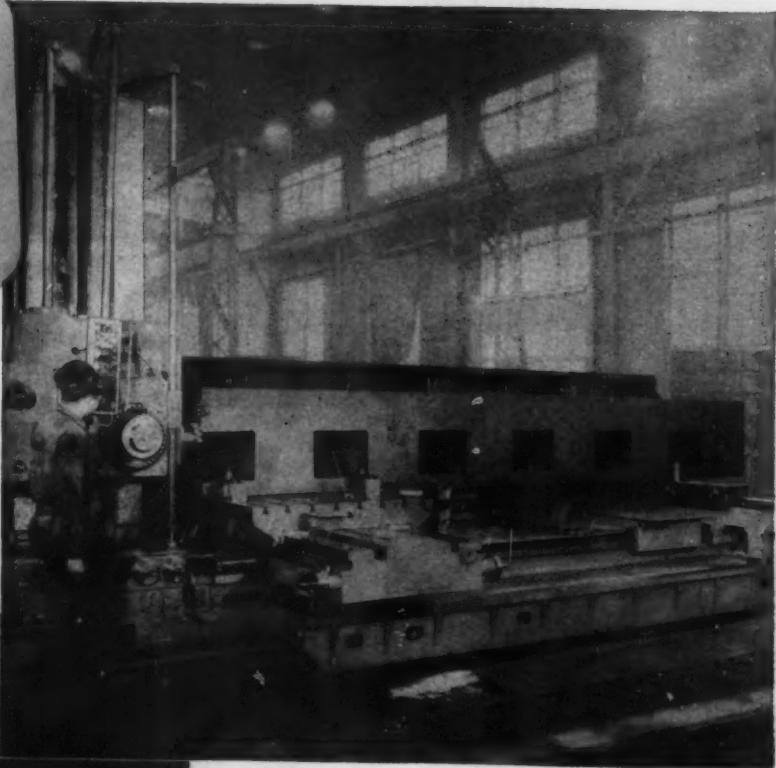
*Precision tool room jobs,
of course, but*

How's a LUCAS on **BIG** work?

RIGHT — Lucas 5" spindle model with extra length bed, milling one end of the base casting for a large wire-drawing machine mounted on the main table and an auxiliary table. Notice, for example, how table overhang for long cross travel is supported by outer ways which are integral with the base casting.

BELOW — Lucas 5" spindle model boring the main (crankshaft) bearings of a 12 cylinder V-type Diesel Electric Locomotive crankcase.

Note the Electric Directional Control Pendant which can be swung and raised or lowered to the most convenient operating position.



These pictures tell the story. Lucas precision horizontal boring, drilling and milling machines are built big and heavy for heavy boring and milling operations on huge pieces.

The combination of high precision with great strength insures the accuracy required in jig and fixture work with the weight and strength for the heaviest duty, and makes a Lucas a true multi-purpose machine — usually the most used equipment in any shop.

Built in 3", 4", 5" and 6" spindle models, all available with Automatic Power Positioning which eliminates jigs and fixtures and makes the horizontal boring machine a highly accurate production tool. Work ranges from 36" x 36" to 96" x 132" standard. All sizes furnished with either two-way or four-way beds. Write for descriptive literature.

LUCAS
CLEVELAND

LUCAS
Precision

HORIZONTAL BORING, DRILLING AND MILLING MACHINES
LUCAS MACHINE DIVISION, THE NEW BRITAIN MACHINE CO.
CLEVELAND 8, OHIO

Carbon • Alloy • Stainless Steel
ARTERIES for any heat transfer unit



QUICK SERVICE on your
tubing requirements for
original equipment or replacement
is available from your nearest
B&W Tube representative and
through local distributors in
principal cities.

Write for new Bulletin TB 329.



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2, N. Y. • Toronto, Ontario • Tulsa 3, Okla. • Vancouver, British Columbia

HOLES HOLES and more HOLES 1500 of them

To be sure, this may be an unusual job. However, it proved the flexibility and practicality of the Bullard Spacer.

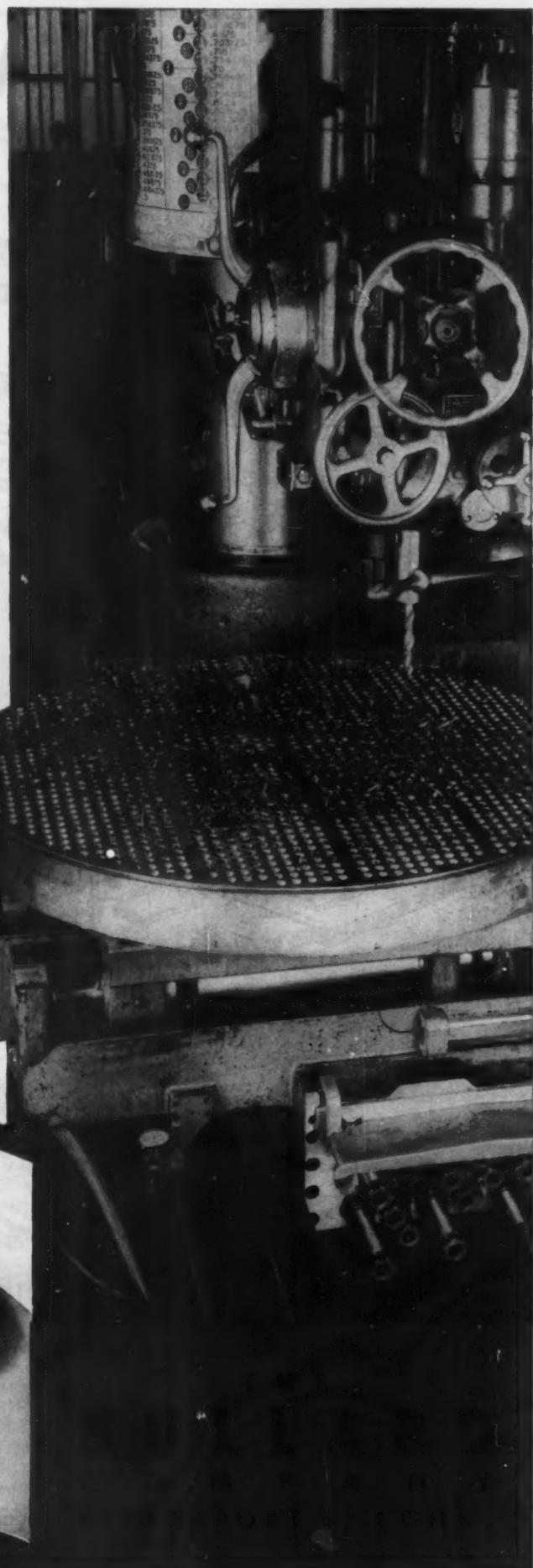
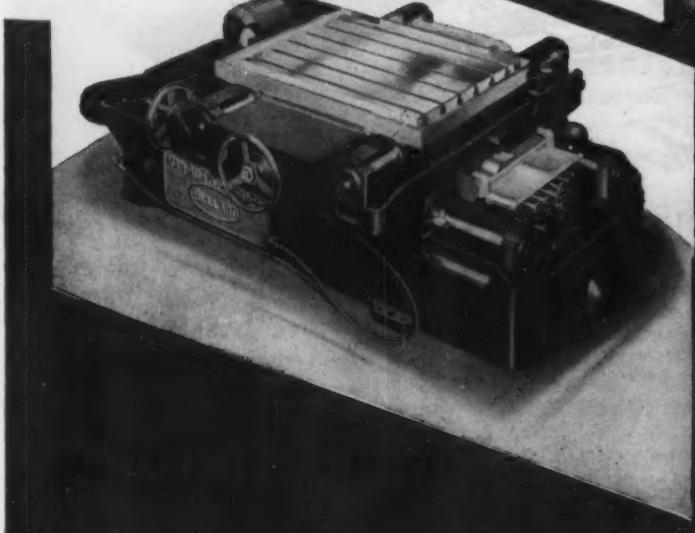
It required several combination of settings between the work location on the table and the drill saddle and arm.

However, the actual set-up and machining time figured 5-½ hours for the Spacer instead of 11-½ by the best previous method.

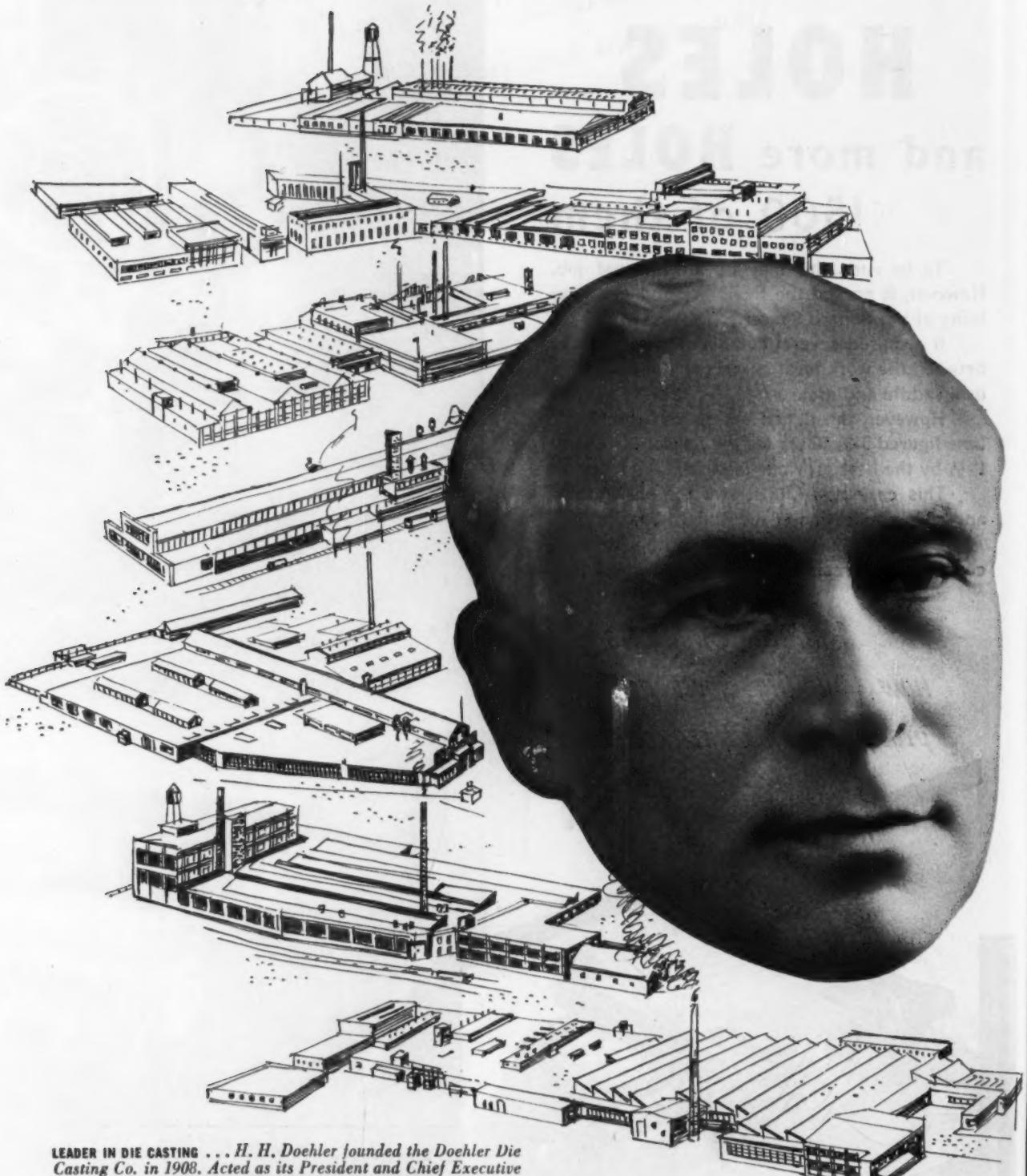
This case study illustrates the possibilities and wide application of the Bullard Spacer.

Here is a machine for spotting, drilling, counterboring, reaming, or tapping—without jigs.

*Ask Bullard Engineers
how your Jig Costs and
problems can be reduced.*



"What makes



LEADER IN DIE CASTING . . . H. H. Doehler founded the Doehler Die Casting Co. in 1908. Acted as its President and Chief Executive for 36 years. In 1944, when the merger with the W. B. Jarvis Co. took place, he was elected as Chairman of the Board of Directors of the new company, The Doehler-Jarvis Corp. (In the background) a panorama of the seven Doehler-Jarvis plants.

Handsome is

AS HANDSOME DOES...

RELIANCE
Job-Fitted
PRODUCTS AND
SERVICES

COLD ROLLED STRIP STEEL*

Coils . . . Cut Lengths . . . All Temps
Slit, Sheared, Deburred
and Round Edge
From WAREHOUSE and
MILL DEPOT STOCKS,
or DIRECT-FROM-MILL

*Detroit Steel Strip is Strip Steel
in Name and in Fact

SHEETS

Cold Rolled . . . Hot Rolled
Hot Rolled Pickled . . . Long Term
Galvanized
Standard or production sizes
or cut to actual working
dimensions
PRIMES
or COST-SAVING SECONDS**
From
WAREHOUSE STOCKS

**Reliance Job-Fitting Methods
apply to seconds as
well as primes

In steel, "intrinsic quality"—in and of itself—is not necessarily a test of Job-Fitness.

In numerous applications, a highly refined product may offer little, if indeed any, advantage over lower commercial grades. For many uses, the lowliest cull may be every bit as suitable as the most highly pedigreed prime.

In steel, it's "Handsome Is As Handsome Does." That quality is best which satisfies the physical and chemical requirements of a specific job and which works most efficiently and economically for an individual customer at a specific time.



This is the Reliance Job-Fitted idea applied to sheet and strip steel. The objectives—to save you production time and/or money.

We'll welcome an opportunity
to be helpful to you.

For Immediate Action Call The Nearest Reliance Plant or Office:

DETROIT STEEL CORPORATION

PRODUCERS OF

Coke and Coal Chemicals • Pig Iron • Ingots
Slabs • Sheet Bars • Billets • Wire Rods
Manufacturers' Wire • Merchant Wire Products
Cold Rolled Strip Steel

GENERAL OFFICES
DETROIT 9, MICHIGAN

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RELIANCE STEEL DIVISION

Processors and Distributors JOB-FITTED Sheet and Strip Steel
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DETROIT PLANT, 13770 Joy Road, WEBster 3-5866, Detroit 28, Mich.

EASTERN PLANT, State & Edmund Sts. (Hamden), New Haven 7-5781, New Haven 7, Conn.

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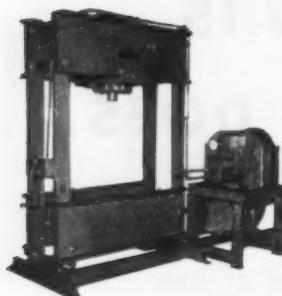
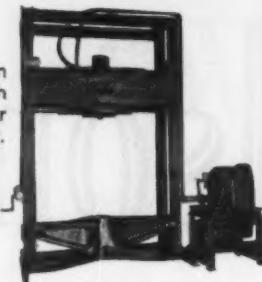
NEW YORK 19, N. Y., 250 West 57th St., COLUMBUS 5-4879

ST. LOUIS 6, MO., 4053 Lindell Blvd., LDeas 4550

TOLEDO 4, OHIO, 2114 Ohio Bldg., GARfield 6384

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SPECIAL 150 Ton Open Yoke Vertical Press with adjustable head member and double-acting cylinder.



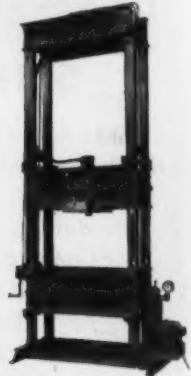
STANDARD 200 Ton Shop Press with 4-Cylinder Power Pump and double-acting cylinder.



...THE FINEST PRESSES FOR THOSE 101 SHOP JOBS

Rodgers
100, 150 AND 200 TON
SHOP PRESSES

STANDARD 150 Ton Shop Press with new Rodgers 4-Speed Hand Pump capable of producing 10,000 psi. maximum pressure.



Fast, Versatile Hydraulic Presses With Hand or Power-Driven Pumps

HERE are versatile, time-saving presses you can use in a hundred ways — the Rodgers 100, 150 and 200 Ton Hydraulic Shop Presses, operated with your choice of the new 4-speed Hand Pump or Power Pump.

The standard 100, 150 and 200 Ton Units include many construction and operating features — the cylinder is movable across entire width of upper head member — Two-way Travel Cylinders can be used when necessary to return heavy dies — Sturdy Press Frame permits full pressure to be applied anywhere across 48" width of lower bolster — Bolster adjusts from 12" to 36"—and there are open ends between uprights to accommodate long material extending through.

If specifications on the standard models don't meet your requirements, we'll modify them or build a special press as required.

There are standard model Rodgers Shop Presses in
60, 80, 100, 150, 200, 300 and 400 Ton Capacities!

SPECIAL 150 Ton Shop Press featuring a 96" opening with adjustable head and bolster.

**SEND FOR
CATALOG...**

New Catalog 313 has descriptions and specifications on the complete line of shop presses.



Rodgers Hydraulic, Inc.

7421 WALKER ST., ST. LOUIS PARK, MINNEAPOLIS 16, MINN.

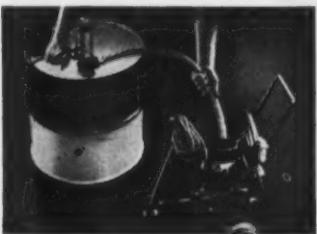
HYDRAULIC POWER EQUIPMENT



How to Cut a Production Expense from \$14 Daily to 21 cents!



Alemite Cuts Costs 3 Ways



1. In Transferring Lubricants...
by eliminating mess, expensive contamination—and cutting man hours 63% for every 100 pounds of lubricant transferred.



2. In Loading Grease Guns . . .
by saving 3½ man hours for every 100 pounds of lubricant loaded into hand guns.

This represents a saving of over \$3000 every year to a Clinton, Mass. company.* It was made possible by solving the kind of problem that may be cutting profits—daily—in YOUR plant, too!

A survey of plant methods revealed that machines had to be stopped a half hour in every 8 hour day, for lubrication. Could this \$14-a-day expense be trimmed? An Alemite Lubrication Engineer recommended a system that lubricates all machines automatically while they're running. The result—lubrication cost was cut to only 21 cents a day! And this saving alone paid for the whole investment in 43 days!



3. In Applying Lubricants . . .
by saving up to 23.9 man hours for every 100 pounds of lubricant applied to bearings.

No matter what size or type of plant you operate, Alemite can show you dozens of ways to make worthwhile savings through more efficient handling of petroleum products. These are facts which you can readily confirm in your own time studies. Contact your local Alemite Industrial Distributor now. Or send for free booklet "11 Ways to Cut Production Costs." Simply attach coupon below to your letterhead. Alemite, Dept. N-60, 1850 Diversey Parkway, Chicago 14, Ill.
*Name on request

ALEMITE
MEANS EVERYTHING FOR LUBRICATION
1. Methods 2. Lubricants 3. Equipment

Another Product of Stewart-Warner

FREE! New Booklet—
"11 Ways to Cut Production Costs"...
(simply attach to your letterhead)



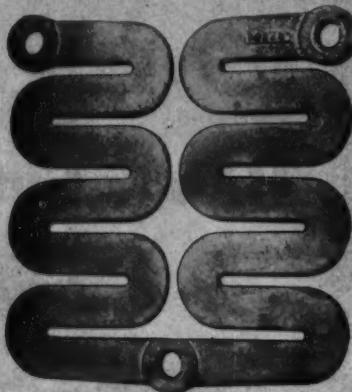
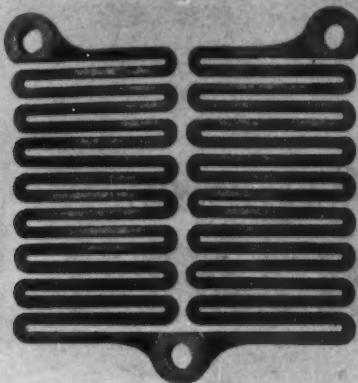
Alemite, Dept. N-60
1850 Diversey Parkway, Chicago 14, Ill.

Please send me without charge or obligation your booklet "11 Ways to Cut Production Costs."

Name _____

Company _____

City _____ State _____



Electric iron sole plate and heat-resisting grids illustrate the adaptability of Gray Iron for heat-resistant applications.

WHERE PARTS "GET HOT" GRAY IRON SERVES BEST!

GRAY IRON Characteristics Include:

- Castability
- Rigidity
- Low Notch Sensitivity
- Wear Resistance
- HEAT RESISTANCE
- Corrosion Resistance
- Durability
- Vibration Absorption
- Machinability
- Wide Strength Range

Whether it's a household appliance or an industrial resistance grid . . . check Gray Iron *first*, wherever elevated temperatures are a factor.

Gray Iron's characteristic structure and the wide range of alloy irons available, insure fast heating, minimum distortion and low coefficient of expansion . . . at the temperatures to which these parts are subjected.

Excellent machinability and good plating characteristics permit economical use of special finishes where required.

Add up Gray Iron's unmatched combination of advantages, and you'll see why designers are specifying more Gray Iron than ever before.

Make It Better with Gray Iron
Second largest industry in the Metal-working field



GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

"no more GAMBLING on tool steel selection"



[1/3 actual size; Selector is in 3 colors]

Here's how it works:

To use the Selector, all you need know is the characteristics that come with the job: type and condition of material to be worked, the number of pieces to be produced, the method of working, and the condition of the equipment to be used.

FOUR STEPS—and you've got the right answer!

1. Move arrow to major class covering application
2. Select sub-group which best fits application
3. Note major tool characteristics (under arrow) and other characteristics in cut-outs for each grade in sub-group
4. Select tool steel indicated

That's all there is to it!

Here's an example:

Application—Deep drawing die for steel

Major Class—Metal Forming—Cold

Sub-Group—Special Purpose

Tool Characteristics—Wear Resistance

Tool Steel—Ardi 150

One turn of the dial does it!

And you're sure you're right!

Since the first announcement, hundreds of tool steel users have received their CRUCIBLE TOOL STEEL SELECTORS. The comments received indicate that this handy method of picking the right tool steel right from the start is going over big.

"Handiest selector I've ever seen"

"No more gambling on tool steel selection"

"You're right, the application should dictate the choice of the tool steel" ... and many, many more favorable comments.

You'll want your CRUCIBLE TOOL STEEL SELECTOR. It uses the only logical method of tool steel selection—begin with the application to pick the right steel! And the answer you get with one turn of the Selector dial will prove satisfactory in every case, for the CRUCIBLE TOOL STEEL SELECTOR covers 22 tool steels which fit 98% of all Tool Steel applications. ALL the tool steels on the Selector are in Warehouse Stock... that means when you get the answer, you can get the steel... fast!

Write for your Selector today! We want you to have it, because we know you've never seen anything that approaches your tool steel problems so simply and logically. Just fill out the coupon and mail. Act now! CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N. Y.

Crucible Steel Company of America
Dept. I, Chrysler Building
New York 17, N. Y.

Gentlemen:

Sure I want my CRUCIBLE TOOL STEEL SELECTOR!

Name _____ Title _____

Company _____

Street _____

City _____ State _____

CRUCIBLE

first name in special purpose steels

TOOL STEELS

fifty years of Fine steelmaking

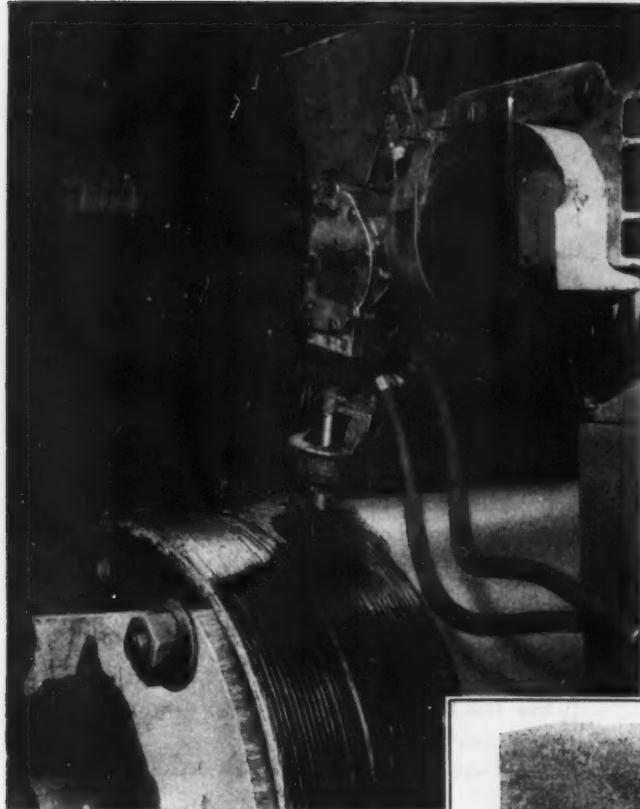
Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DENVER • DETROIT
HOUSTON, TEXAS • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH • PROVIDENCE
ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.

Give New Life to Worn Parts

... Rebuild Them by **UNIONMELT Welding**

This automatic process saves time and money—welding is fast—parts are returned to service quickly—new surface is often superior to original—

Almost any part that can be suitably positioned can be rebuilt by UNIONMELT welding. It has been used successfully on parts such as steel mill rolls, guides, mandrels, journals; wheels for locomotives, cars, and cranes; pipe molds, and press plungers and cylinders.



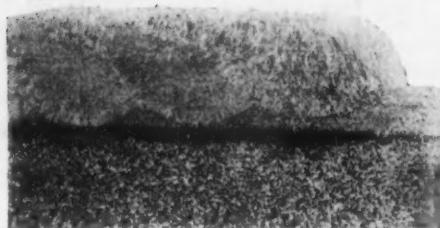
Rebuilding a 24 in. diameter press plunger.

Deposits of almost any thickness can be made of—

High carbon, flame-hardenable steels
Wear-resistant and hard-facing materials
Corrosion- and heat-resistant steels

With UNIONMELT electric welding, clean, dense, uniform weld metal can be deposited at the highest known welding speeds. There is no glare, flash, or spatter during welding. If a finished surface is needed, only minimum machining is required because of the smoothness of the weld deposit.

There are many LINDE methods of joining, rebuilding, forming, cutting and treating metals. LINDE Engineering Service can help you in production, construction, and maintenance. Just call the nearest LINDE office.



A flat surface is produced by offsetting each bead.



THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

General Office: New York, N. Y.  Offices in Other Principal Cities

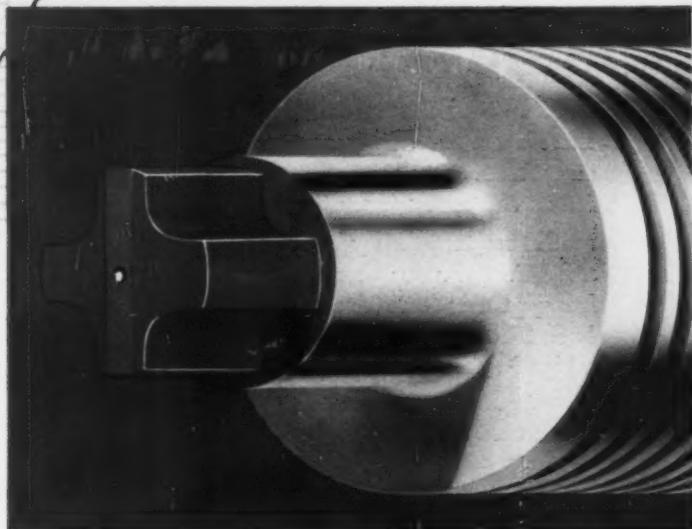
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

The words "Linde," and "Unionmelt" are registered trade-marks of
The Linde Air Products Company

WIRES HOLDS THE WORLD TOGETHER

THE WIRE INDUSTRY in the U.S.A. traces its major development from 1831* when a small mill was set up in Worcester, Massachusetts. Within little more than a century the industry has become a major metal consumer requiring about five million tons annually of wire and rod mill products.

*Mackintosh-Hemphill Company dates from 1803



MACK-HEMP ROLLS for rod mills have been used by major steel companies since 1840. M-H engineers recently developed **GARRISON SPECIAL #1**, a new addition to the green-striped red wabbler family for rod production.

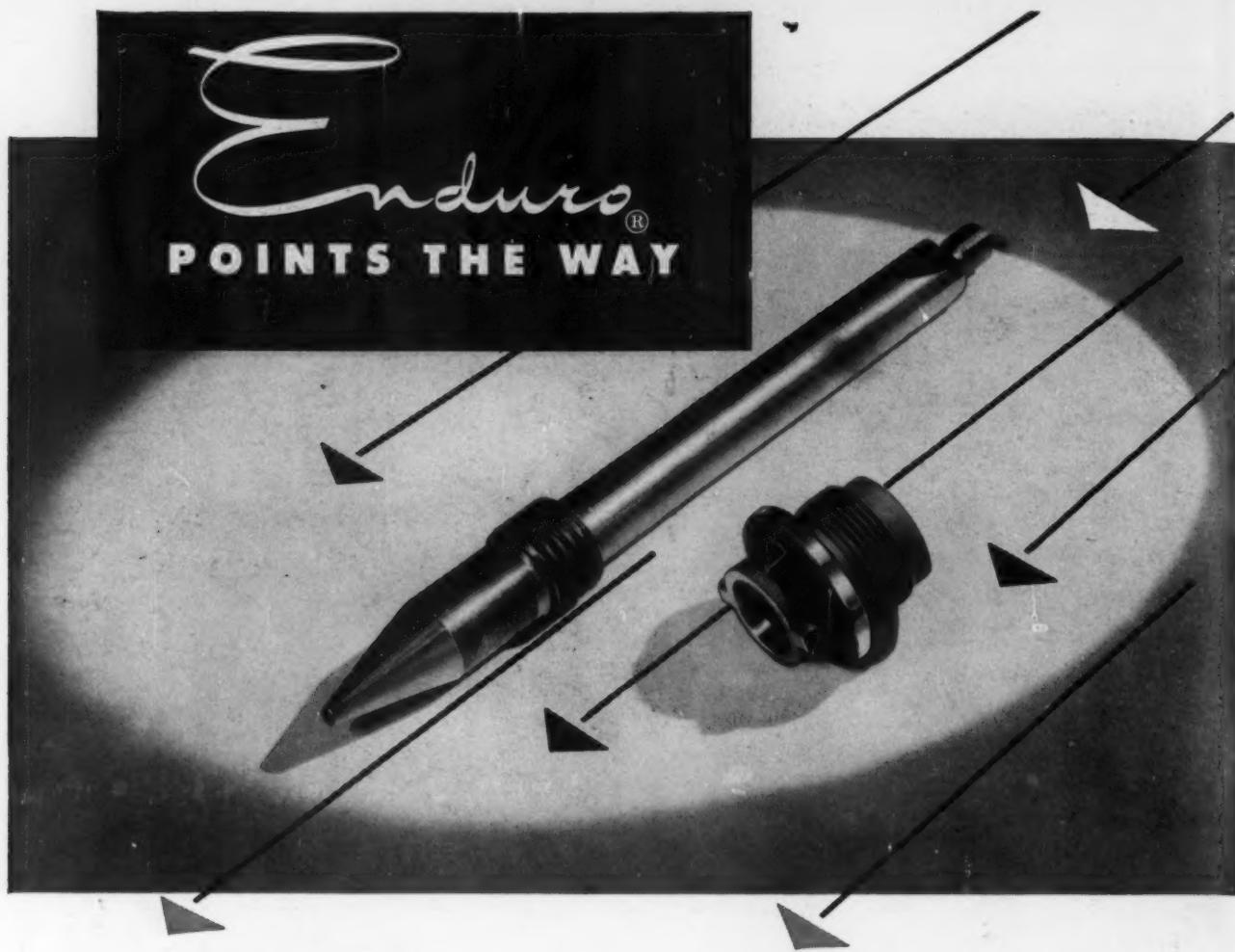
This new *deep-chill* roll has already proved itself in actual rod mill operation. Here's a real production engineering roll worth investigating today — Mack-Hemp's **GARRISON SPECIAL #1**. In fact, it's always worthwhile to keep an eye on what's new at Mack-Hemp.

MACKINTOSH-HEMPHILL COMPANY

Makers of the Rolls with the Striped Red Wabblers

PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: rolls . . . steel and special alloy castings . . . completely integrated strip mills . . . heavy duty engine lathes . . . the new Mackintosh-Abramsen straighteners . . . improved Johnston patented corrugated cinder pots and slag-handling equipment . . . shape straighteners . . . end-thrust bearings . . . shears . . . levellers.



Machinability plus Corrosion • Resistance

High machinability . . . unsurpassed corrosion-resistance . . . here are two of the many good reasons why it pays to use Republic ENDURO Stainless Steel in Free-Machining analyses.

In this stainless steel needle valve and seat used in oil well flow lines, for example, high machinability is obtained from ENDURO type 420-F bar stock. Corrosive crude oil has little effect upon these parts which would be short-lived if made of carbon steel.

A product of Republic's famed Union Drawn Division, ENDURO Cold-finished Bars are

consistently uniform in accuracy of section, fine surface finish and MACHINABILITY. Add ENDURO's natural sanitation, heat-resistance, high strength and ease of cleaning, and you have *all* the reasons for using them in YOUR PRODUCT.

For further information about ENDURO Stainless Steel Bars—cold finished, hot rolled and wire—write today.

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.



Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

BUILDERS OF THE BRASS INDUSTRY



JULIAN R. HOLLEY

(Sixth President of BRISTOL BRASS)

Grocery clerk with Brass in his blood . . . Power behind several thrones . . .

Holder of every mill job from stenographer to president . . .

Dispeller of "black magic" in Brass-casting

PRODUCTION genius and general manager through four presidencies (including his own), Julian Holley could do anything in the world, according to his associates, except "build a barrel with only the bung-hole to start with." When he succeeded Pierce Welch in 1910, Mary Baker Eddy and King Edward VII had just died, and Korea was annexed by Japan. War clouds were piling up on the horizon.

But "J. R." had only one interest in life

— Bristol Brass. He installed a large steam engine in the rod and wire mill . . . found new ways to control scientifically the quality and uniformity of Brass alloys . . . and guided the different destinies of the Brass mill, burner shop, and the "silver shop" or table hollow-ware business. In his time, Bristol Brass stock multiplied fivefold.

Holley's many-phased abilities and singleness of purpose set a pattern in Bristol Brass management which persists right to

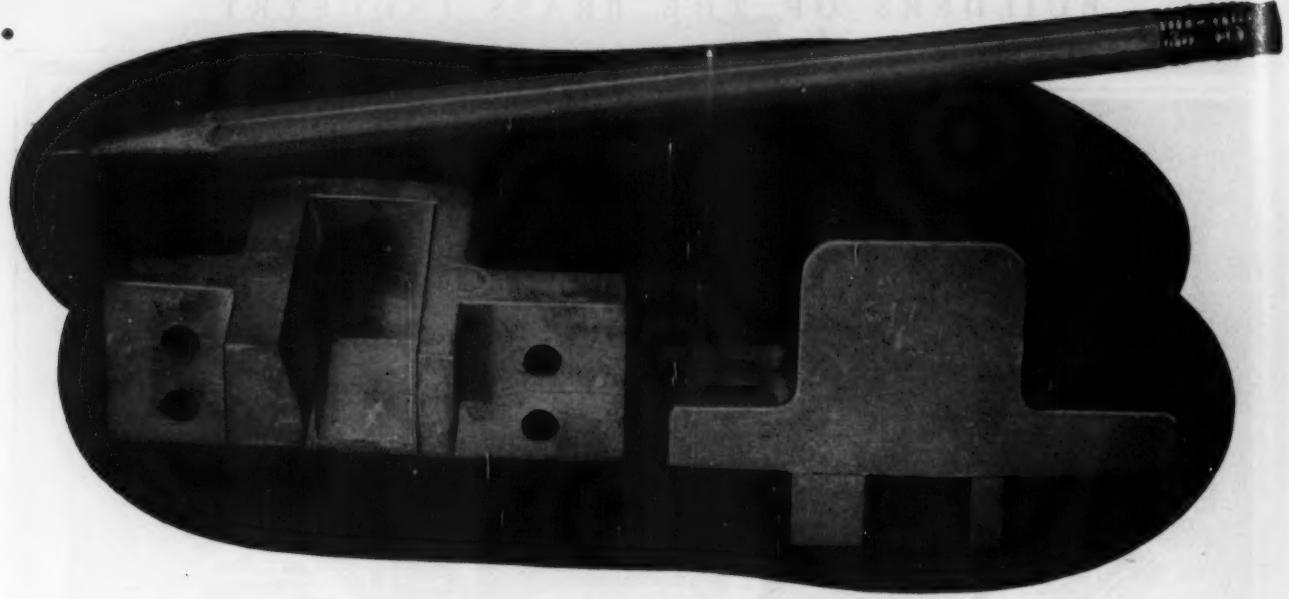
the present day. If you buy Brass sheet, rod, wire, or extruded shapes for any product, you will find that Bristol Brass-men know their business from scrap to shipping platform . . . that they move fast, unhampered by red tape . . . and come through on time with shipments that check to the last decimal of the specs.

Now, if we seem to talk your language, let's talk it over in person. Write.

One Hundred Years of BRASS made "BRISTOL FASHION"

Like the world-famed merchant ships from Bristol, England . . . Always prompt, shipshape, reliable
The BRISTOL BRASS CORPORATION, makers of Brass in Bristol, Conn. since 1850





Design problem —solved in one operation

INCO Nickel Alloys

Monel® • "R"® Monel • "K"® Monel • "KR"® Monel • "S"® Monel
Nickel • "L"® Nickel • "Z"® Nickel • Inconel® *Reg. U.S. Pat. Off.

"Task Metals" for Industry



There is a story behind this picture worth several thousand dollars to one manufacturer. It may be worth a tidy sum to you, too.

Looking at the picture you see two life-size views of a Monel part used in quantity by this machinery manufacturer.

Just make a quick estimate as to what you would expect to pay for it. Consider the cost of the forging dies...broaching the slot...silver-soldering the back plate to close the end...drilling four bolt holes...and facing the back flange to fit the curved contour of a cylinder.

Something around \$3.25, wouldn't you say?

Actually, this manufacturer is getting these parts exactly as you see them for just about a third less than you estimate.

How? By precision casting. One operation, one piece—and there you have the finished part all ready to bolt on the machine.

That is just one example of the variety of different parts now being produced in INCO's new Precision Casting Plant. The beauty of precision casting is the way its versatility opens up new possibilities for quantity-producing metal parts in designs too intricate to fabricate economically by conventional methods or downright impractical to produce by any other method.

IF YOU HAVE A PROBLEM with a part whose cost seems too high...or a part where a precision casting might eliminate a number of operations (as with this latch-keeper)...or a part whose design cannot be practically worked out via other methods...send us a sample or blueprint, along with the approximate quantity needed. Within a few days you'll receive our frank answer telling you whether or not precision casting offers a better solution.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N.Y.



BUSHINGS

PRECISION BRONZE BARS

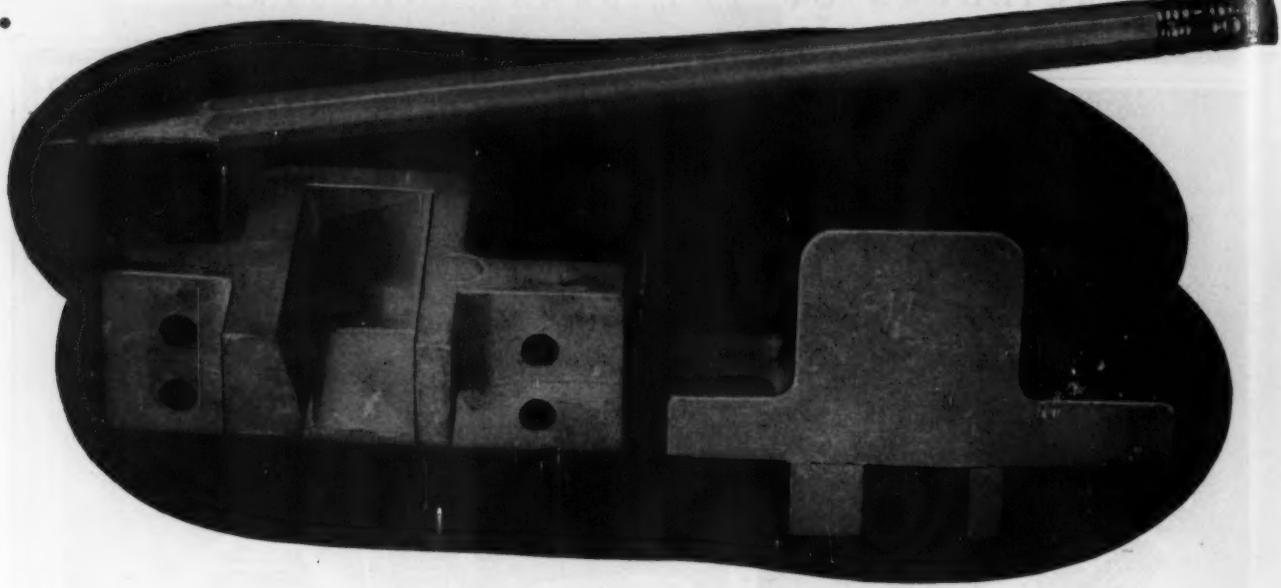
BRONZE BEARINGS

Bunting Finished Bronze Bars and completely machined Standard Stock Bearings offer real economy in time, material, cost.

The leading distributor in your Community almost certainly is a Bunting Stock-carrying Distributor.

The Bunting Brass and Bronze Co., Toledo 9, Ohio.
Branches in Principal Cities.

Bunting
®
65



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INCO Nickel Alloys

Monel® • "R"® Monel • "K"® Monel • "KR"® Monel • "S"® Monel
Nickel • "L"® Nickel • "Z"® Nickel • Inconel® *Reg. U.S. Pat. Off.

"Task Metals" for Industry



THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N.Y.



BUSHINGS

PRECISION BRONZE BARS

BRONZE BEARINGS

Bunting Finished Bronze Bars and completely machined
Standard Stock Bearings offer real economy in time,
material, cost.

The leading distributor in your Community almost
certainly is a Bunting Stock-carrying Distributor.
The Bunting Brass and Bronze Co., Toledo 9, Ohio.
Branches in Principal Cities.

Bunting
®
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consider
DIE CASTING
when redesigning
for LOWER COSTS

THE DIE CASTING PROCESS: Speed of production is the essence of the die casting process—the shortest distance between raw material and finished product; it is a precision, low-unit labor process, capable of producing direct from the raw material the most complex parts in nearly finished form at a single operation.

ZINC DIE CASTINGS: Zinc is the most adaptable metal for the die casting process and provides the best combination of physical and chemical properties. Zinc die castings are stable, strong, and can be cast to close tolerances; they are easily machined and a large variety of beautiful metallic and organic finishes can be readily applied to the castings.

Industry's recognition of these factors is indicated by the phenomenal growth of die casting as a production tool plus the fact that nearly 75% of all die castings by weight are made of zinc. **DIE CASTING** is the Process • **ZINC**, the Metal • **BUNKER HILL**, the Preferred Zinc

BUNKER HILL 99.99+% ZINC

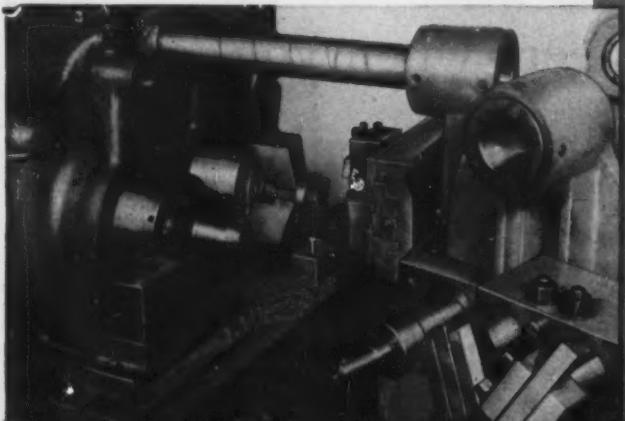
EASTERN SALES AGENTS ST. JOSEPH LEAD COMPANY 250 PARK AVENUE, NEW YORK 17
SALES OFFICE FOR PACIFIC COAST NORTHWEST LEAD COMPANY SEATTLE, WASHINGTON

Combining cuts . . .

**—A PAY-OFF FEATURE
CHARACTERISTIC of ALL
POTTER &
JOHNSTON
AUTOMATICS**

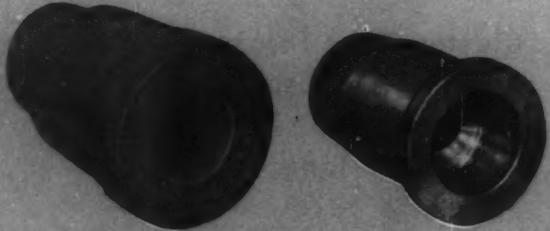
And P&J's tool engineering service makes the most of it — by eliminating unnecessary work handling and reducing machining times to an absolute minimum. Mass-producing any precision work of this class on obsolete equipment, or on machines less versatile or flexible, costs you money.

But it costs you nothing to figure it out for yourself, on your own work. Simply send a sample part or prints to Pawtucket for a P&J recommendation and estimate — then compare.

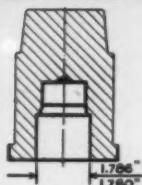


P&J 50 YEARS' EXPERIENCE
IN TOOLING FOR
Precision + Productivity + Economy

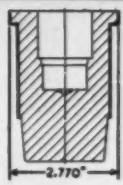
For Example: THESE ANNEALED
CAST IRON THIMBLES



ARE MACHINED WITH MAXIMUM PRODUCTIVITY AND PROFIT ON THE P&J 5-D2-9 (2 SPINDLE) AUTOMATIC . . . ONE FINISHED PIECE PER TURRET CYCLE. HEAVY LINES IN DRAWINGS INDICATE SURFACES MACHINED. OPERATIONS DETAILS, TURRET FACE BY TURRET FACE, SHOW HOW CUTS ARE COMBINED TO SAVE TIME AND EARN PROFITS.



First Operation on
REAR SPINDLE



Second Operation on
FRONT SPINDLE

1st T.F.	Drill Hole	Rough Turn Taper
2nd T.F.	Rough Bore and Face 2 Dias. — Machine Bevel. — Rough Face Flange. — Turn Flange O.D.	Turn Flange Dia. Turn Body Dia. — Face Shoulder
3rd T.F.	Bore 2 Dias.	Finish Turn Body Dia. — Face Shoulder. Finish Flange O.D.
4th T.F.	Finish Face Shoulder	Finish Face Flange. — Face Bottom of Bores with Slide Tool
5th T.F.	Ram 2 Dias.	Size Turn Body Dia.

**POTTER &
JOHNSTON CO.**

PAWTUCKET, R. I.
subsidiary of PRATT & WHITNEY
Division Niles-Bement-Pond Company



TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY

Cluster Gear forging,
weight 28 lbs. This
forging is 6" in di-
ameter, 5" long; both
ends are formed at
one setup of the dies.



**Consult our engineers when you
are contemplating conversion to
forgings or when you are in need
of reliable forging service.**

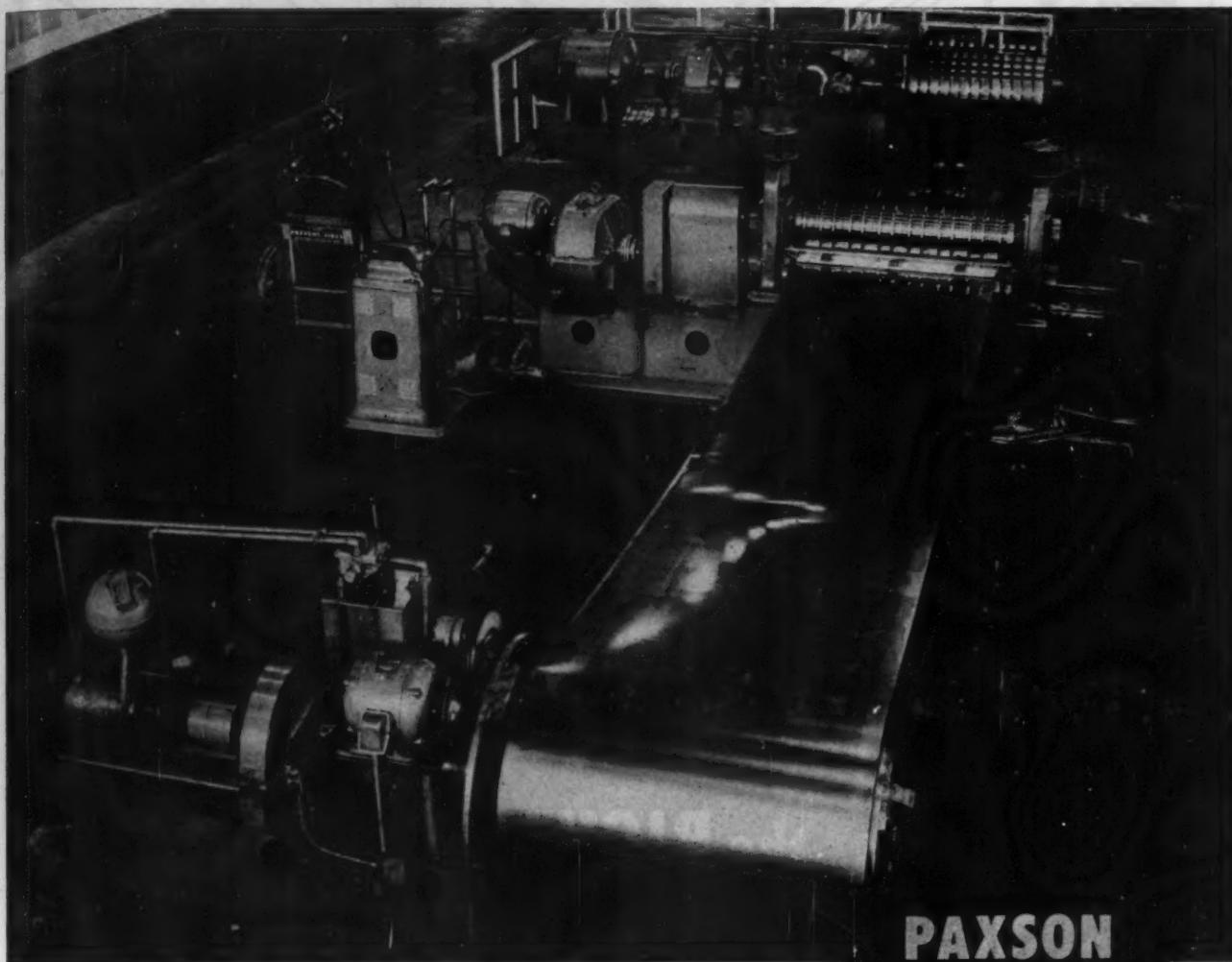
TRANSUE & WILLIAMS

STEEL FORGING CORPORATION • ALLIANCE, OHIO

SALES OFFICES: NEW YORK • PHILADELPHIA • CHICAGO • INDIANAPOLIS • DETROIT • CLEVELAND

OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

PAXSON GIVES YOU THE EDGE



Line shown operating at Andersen-Carlson Mfg. Co., Torrance, California, one of many tube manufacturers using PAXSON lines.

**PAXSON
MACHINE CO.
Salem, Ohio**

In order to eliminate delay and reduce inventory, contact PAXSON. Your investment in PAXSON STRIP SLITTING MACHINES will assure smoother production schedules, lower inventory costs, and larger profits.

PAXSON SLITTERS in widths from 24" to 60" to handle light and heavy gauges, various coil weights, and coil inside diameters.

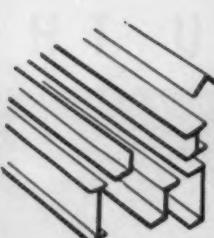
PAXSON MACHINE COMPANY, ENGINEERS AND BUILDERS OF COLD-ROLLED STRIP-MILL EQUIPMENT, SPECIALIZING IN SLITTING LINES

DO YOU FLY? 2800 ft. E. W. runway and clubhouse, private field 2 miles west of Salem maintained for your convenience. Wire or phone arrival time. We will meet your plane.

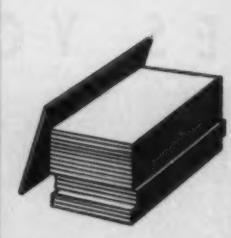
REMEMBER, ALL PAXSON LINES ARE CUSTOM BUILT



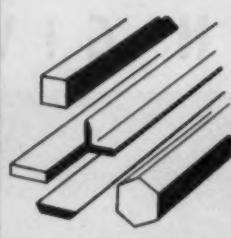
HOT AND COLD ROLLED SHEETS AND STRIP



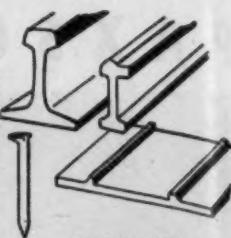
STRUCTURAL SHAPES



CARBON STEEL PLATES



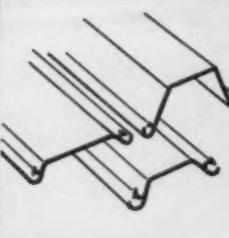
CARBON STEEL BARS



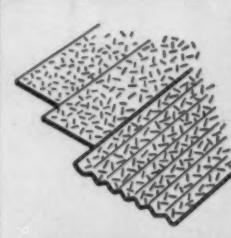
RAILS AND TRACK ACCESSORIES



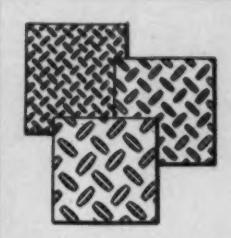
HI-BOND^{*} REINFORCING BARS



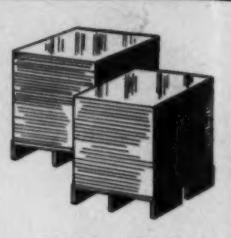
SHEET PILING



GALVANIZED SHEET PRODUCTS



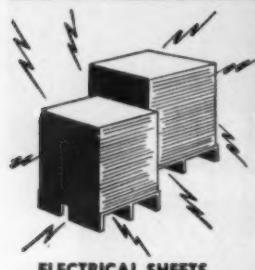
4-WAY^{*} SAFETY PLATE



TIN MILL PRODUCTS

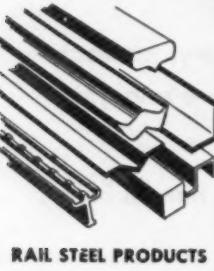


ENAMELING IRON AND TI-NAMEL^{*} SHEETS

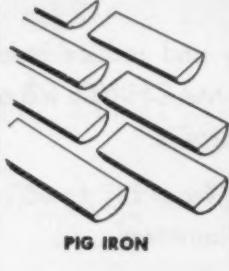


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LIMESTONE



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Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul



UNITED 4-STAND TINPLATE MILL



The canning industry—America's largest user of tinplate—depends largely upon progress in the development of new and better steel rolling and coating processes to broaden its ever growing usefulness to the public.

One step in the process of making better tinplate for canning is the giant new United mill shown in operation. Designs for this, and other mills with production speeds up to 5000 feet per minute, are available for duplication, or for revision to suit your requirements. UNITED's engineers will be glad to confer with you concerning your plans for increased tinplate production.



UNITED ENGINEERING AND FOUNDRY COMPANY PITTSBURGH, PENNSYLVANIA

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Subsidiaries: Adamson United Company, Akron, Ohio
Lobdell United Company, Wilmington, Delaware
Stedman Foundry and Machine Company, Inc., Aurora, Indiana
Affiliates: Davy and United Engineering Company, Ltd., Sheffield, England
Dominion Engineering Works, Ltd., Montreal, P. Q., Canada
S. E. C. I. M., Paris, France

Buried Treasure in Your Product?



**More than likely...
if you can dig up
New Ways to
make it do more
for your customers
... by COUNTING**



No. 1239 Predetermining Counter signals operator or actuates mechanism to stop machine at end of pre-set run.

Dig deeply into this million-dollar question: "How could *my* product increase its usefulness and sales . . . by counting?" And you may well uncover a new and distinctive merchandising appeal that will set your product apart from competition . . . as so many manufacturers have done.

It's as simple as this: If your product

is mechanically or electrically operated, then it's definitely worth a search to see if there's hidden sales-treasure buried there. This can be quickly determined by some fast spade-work done by a Veeder-Root engineer, paired off with your design engineer. And the digging can get under way . . . *any time you say*.

Veeder-Root

COUNTERS



COUNTING DEVICES

Write for 8-page "Counter Book" which shows all types of V-R electrical, mechanical, and manual counters . . . standard and special.

VEEDER-ROOT INC., HARTFORD 2, CONN.
In Canada: Veeder-Root of Canada, Ltd., 955 St. James Street, Montreal 3.
In Great Britain: Veeder-Root Ltd., Kilspindie Road, Dundee, Scotland.



Designed for the popular priced field, Whitehouse Products, Inc. has introduced a degree of precision befitting much more costly cameras. The Beacon "Two-Twenty-Five," handsomely styled and boasting a double meniscus 70 mm. fixed-focus lens, uses standard film and is inexpensive to operate. A flash attachment is available for synchronized flash pictures, both in color and black and white.

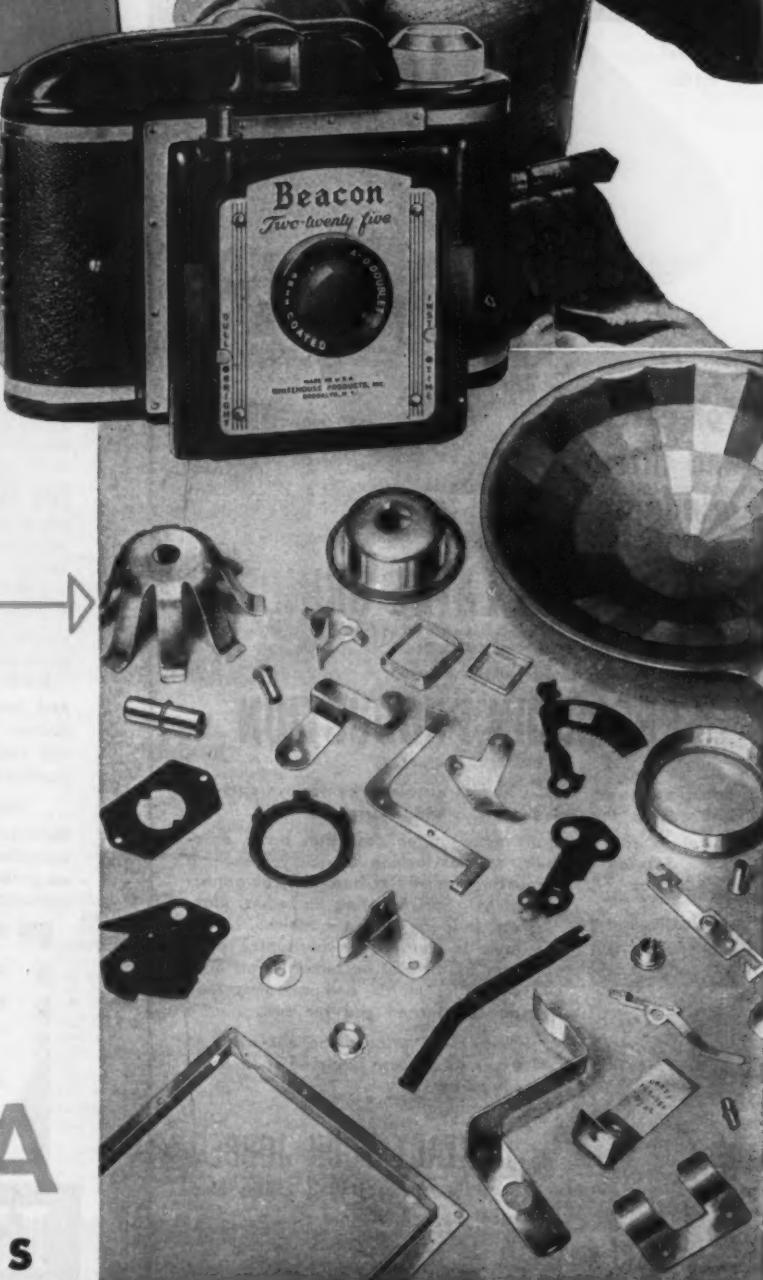
This policy of offering high-quality at low-cost has met with marked success, for more than 300,000 Beacon Cameras have been sold to date.

And here are some of the parts that go into it

Made in large quantities, to unusually close tolerances in multiple-die production, these parts (approximately half scale) serve to illustrate our ability to supply precision made stampings and press drawn items in copper, brass, nickel silver and other metals, to exacting requirements and specifications.

Complete engineering services and tool-making facilities are available. Your inquiry, accompanied by a sample, sketch or description of the part required, together with other pertinent information, will receive our prompt attention. Address your inquiry to Waterbury Brass Goods Branch, The American Brass Co., Waterbury 20, Conn.

50100



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COPPER & BRASS

DEEP DRAWN SHELLS, CUPS, BLANKS, STAMPINGS, EYELETS, FERRULES, GROMMETS, FASTENERS

June 29, 1950

103

**More Profit...
More Work Per Man...
Per Job...and "no per-haps"**



Model
HLGE



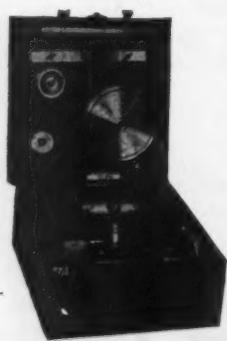
For external
and internal
grinding

PRECISION LATHE GRINDER FOR PRECISION PRODUCTION

Speed range up to 30,000 rpm obtained by various size pulleys adapts this grinder for a wide variety of work.

Motor housing pivotally mounted on cast iron base; automatic take-up for belt; special locking device for holding belt tension; T-bolt mounting for radial and vertical adjustment. For mounting on lathes, planers, shapers, milling machines, boring mills in vertical or horizontal position. Can also be mounted on back of lathe; motor and grinding quill can be turned end for end.

Photo shows grinder and equipment in carrying case furnished as standard equipment.



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THE UNITED STATES ELECTRICAL TOOL CO.
CINCINNATI, OHIO

"ARBOR PRESS" IN NAME ONLY!

FRONTIER BRONZE CORPORATION SPEEDS MANUFACTURE OF ALUMINUM PIPE WRENCH WITH
KRW MOTOR-DRIVEN ARBOR PRESS



SEE HOW A LITTLE INGENUITY SAVES

A LOT OF MONEY! A special coining die used in this standard KRW 50-ton motor-driven arbor press removes burrs which result from normal manufacturing procedure. A simple operation which eliminates the need of costly grinding and assures a free-running, tight fitting, adjusting nut. This new wrench weighs 60% less than conventional types yet withstands the same tests.

THE CONVENTIONAL ARBOR PRESS has come a long way in the past few years. From such every day tasks as straightening and bending, it has grown into a full size production tool. Today — because of their low initial and operating cost — you'll find KRW Arbor Presses doing hundreds of manufacturing operations in all sorts of plants. A little ingenuity, combined with simple, inexpensive dies can save you money by releasing heavier, more expensive equipment for larger work.

KRW Hydraulic Arbor Presses are available in varying sizes and tonnages, either hand-operated, air-operated or motor-driven. Tell us your needs... we are fully equipped to advise and engineer presses to do your particular job. Deliveries on standard presses within 10 days.

NEW KRW 100-Ton Blanking, Forming, Stamping Press
Batteries of these New KRW Presses are now in use in many manufacturing plants doing all manner of work hitherto handled on presses whose installation costs are higher than the total cost of these revolutionary KRW Presses. Write for literature.

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please send me complete information on KRW Arbor Presses
 100-ton Hydraulic Presses

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City and Zone..... State.....

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CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSOR

1100 cu. ft. Worthington Vertical Duplex 10½" x 11x11".
225 H.P. Syn Motor A.C. 100 lbs. Pressure

ANGLE BENDING ROLL

#20 Buffalo Angle Bending Roll, Motor Driven,
Capacity 1½" x 1½" x 3/16" Angles

BALER—METAL

Style 150 Galland-Henning Triple Compression Baler,
Box 60x4x12½"; Bale 20"x16"x20"

BENDERS—PIPE

No. 504 Wallace 4" Pipe Bending Machine, Capacity
180°. Motor driven, fully automatic, hydraulic, ro-
tary type. New 1943

No. 500 Wallace 1½" Bending Machine, Motor Drive,
180°. Motor Driven, Fully Automatic, Hydraulic

BENDING ROLLS

6" x 14" Berthel Initial Type, Motor Driven
Kling Pyramid Type, Motor Driven

10" x 14" H & J Pyramid Type, Belt Driven

12" x 14" H & J Pyramid Type, Motor Driven

26" x 1" Southway Pyramid Type, Motor Driven

29" No. 314 H & J Pyramid Type, Motor Driven

BOLT THREADING MACHINE

2" Landis Single Head, Equipt with Lead Screw

BOLT TRIMMER

Watbury Farrel #3 Bolt Head Trimmer, Capacity 1"

BORING MILLS

8" Cincinnati Hypo Vertical Boring Mill 2 Rail,
1 Side Head

8" Morton Boring, Drilling, Milling, Planing &
Slotting Machine, No. 11 Morse Taper

BRAKES—PRESS TYPE

4" x 12" Ga. Dual Model 40-8

12" x 28" x 16" Cincinnati

10" x 32" x 16" Columbus

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton OET Crane 26' 8" Span 220/3/60 AC.

5 ton Shepard-Niles 27' 3" Span 220 Volt DC.

5 ton Shepard-Niles 30' 6" Span 220 Volt DC.

5 ton Wright 47' Span 140/3/60 AC.

5 ton Whiting 52' Span 440/3/60 AC.

5 ton OET 56' Span 220/440 AC.

5 ton Harnischfeger 59' Span 440/3/60 AC.

7½ ton Harnischfeger 31' 1" Span 220 Volt DC.

10 ton Conco 37' Span 220/440 AC.

10 ton OET Crane 60' Span 220/3/60 AC.

10 ton Northern 56' Span 220 Volt DC.

10 ton Industrial 62' Span 440/3/60 AC.

10 ton P & II 66' Span 220 Volt DC.

10 ton P & H 72' Span 220 Volt DC.

15 ton Niles 47' Span 220/3/60 AC.

200 ton Alliance 100' Span 220 Volt DC With 25 ton
Auxiliary Hoist

CUT OFF MACHINE

Yoder Model M Hydraulic Rotary Cut Off Machine, 10
Ft. Bed. Max. Capacity 4" O.D. x .188"

DIE SINKING MACHINE

Keller Duplicator Type BL3416, with Keller Cutter
Grinder. Complete with Accessories

DRAW BENCH

60,000 lb. Aetna Standard Single Chain Draw Bench,
45 Ft. Length of Draw, Motor Driven—New 1948

DRILL—RADIAL

72" Dress Full Universal, No. 5 Morse Taper

FLANGING MACHINE

1½" McCabe Pneumatic Flanging Machine

FORGING MACHINES

2" XN Acme 14" Pawtucket

2" 3½" 3" 4" 4" Ajax

3" 3½" 4" 5" National

FOUNDRY EQUIPMENT

15" x 20" American Wheelabrator Tumblast

36" x 42" American Wheelabrator Tumblast

\$232-38 Ouborn Jolt Squeeze Rollover Power Draw
Molding Machine

FURNACES

100 KW 300 lb. Ajax Electrothermic Induction Heat

Furnace 240 Volt 360 Cycle. Complete with accessories

Leeds & Northrup 20236 Homo-carb Electric Furnace.

No. 9770-36-10-8. Complete with all accessories

1000 cu. ft. Moore Size "S" Nose Tilt Type Furnace. Complete with Transformer Equipment

1½ ton Moore Size "R" Rapid Lectromelt Furnace.

Complete with Transformer Equipment

2 Ton Heroult Nose Tilt Type Melting Furnace

3 Ton Heroult Rocker Tilt Type Melting Furnace

6 Ton Moore Type "O" Lectromelt Furnace

Electric Fur. Co. Roller Hearth Heating Furnace 72"

with 24" high 34" long. Gas & electrically heated

GEAR REDUCERS

600 H.P. Westinghouse Reduction Unit Ratio 3:76-1

500 H.P. Mesta Double Reduction Ratio 14:1

800 H.P. Falk Single Herringbone Gear Reducer

3600 RPM

HAMMERS—BOARD DROP

1200, 2000, Chambersburg

1000, 3000 lb. Billings & Spencer

HAMMERS—STEAM DROP

3000 lb. Chambersburg

1500 lb. Erie

HAMMERS—STEAM FORGING

600, 1500, 4000 lb. Chambersburg

1000, 1100, 1500 lb. N-B-P

1100, 1800, 3500, 12,000 lb. Erie

8000 lb. Moran

HAMMERS—MISCELLANEOUS

1000 cu. ft. Chambersburg Pneumatic Motor Driven Forging Hammer, Complete with Motor

30" x 36" Chambersburg Coco Stamp Hammer

30" x 48" Chambersburg Coco Stamp Hammer

48" x 48" Chambersburg Coco Stamp Hammer

48" x 66" Chambersburg Coco Stamp Hammer

66" x 36" Chambersburg Coco Stamp Hammer

96" x 60" Chambersburg Coco Stamp Hammer

LIFT TRUCK

1000# Yale & Towne "Worksaver"—New 1947

MOTOR GENERATOR SETS

1000 KW G.E. Motor Generator direct connected to

1400 H.P. G.E. 220/3/60 Syn. Motor

1250 KW G.E. Motor Generator direct connected to

1750 H.P. G.E. 6000 Volt A.C. Syn. Motor

NIBBLER

No. 10-B Gray Turret Head Metal Nibbler, M.D.
Capacity 9/16", With Circle Cutting Attachment

PLANERS

33" x 36" x 10' Niles Planer, One Rail Head
42" x 42" x 10' Rockford Hydraulic Planer

48x48" x 14' Niles Cement Pond Four Heads, M.D.

48" x 48" x 16" Niles Four Head, M.D.

48" x 48" x 20' Cincinnati Hypo Double Housing
Planer

48x48" x 20' Cincinnati Hypo Planer, Four Head

48x48" x 32' Chamberlain Hypo Planer, Four Head, Motor Dr.

60x60x21' Cincinnati Planer, Motor Drive

120" x 120" x 16" Pond Four Head Planer

16" x 14" x 36" Mesta Four Head, M.D.

PLANERS—OPEN SIDE

36" x 36" x 8' Cleveland Openside Planer

42" x 42" x 10' Cleveland, Three Head, Belt, M.D.

48" x 48" x 10' Rockford Hydraulic Openside Planer

60" x 60" x 16" Detrick & Harvey, Three Head, M.D.

PLANER—PLATE EDGE

30" x 2" Cleveland Plate Edge Planer, Motor Driven.
Equipped with 14 Pneumatic Jacks

PLATING EQUIPMENT

Complete unit with all accessories. Modern, in excellent
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With or without
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trends for over quarter of a
century

PRESSES—HYDRAULIC

50 ton Williams & White Four Column Hydr. Press
19" Stroke, 24" Between Columns. Self-Contained

with Pump and Elec. Equipment. New—never used

200 ton Elmes Hydraulic Press, Self-Contained 10"

Stroke, 35" Distance Between Columns

500 ton Southwark Open Throat Hydraulic Press, 12"

Stroke, Platen 36" x 56"

1000 ton Chambersburg 4-Column Hydraulic Press,

18" Stroke, Bed Area 48" x 48"

1000 ton United Steam Hydraulic Forging Press Davy

Pat. Quick Acting. Distance between columns
7" x 29", Stroke of Ram 48"

PRESSES—HYDRAULIC WHEEL

600 ton Niles—86" Between Parallel Bars

500 ton Niles—48" Between Parallel Bars

PRESSES—STRAIGHT SIDE

No. F-1200-36 Clearing Press, 18" Stroke, Bed Area
36" x 38" F to B x R to L

No. 620 Bliss High Production Press Flywheel Type
1½" Stroke, Face of Slide 8" x 16¾"

PRESSES—TOGGLE DRAWING

No. 4102 Bliss Double Crank Toggle Drawing Press.

25" Punch Stroke, 17" Blankholder Stroke, 98"
Between Uprights

No. 3½" Bliss Single Crank Toggle Drawing Press

6½" Draw. Will accommodate blanks 20" x 20"

PRESSES—TRIMMING

No. 16 Erie Trimming Press, 6" Stroke, Bed Area
30" x 26"

No. 58 Toledo Trimming Press, 6¾" Stroke, Bed
Area 48½" x 26½"

No. 73½" Bliss Trimming Press, Tie Rod Frame 440

ton capacity, 16" Stroke, 36" Between Uprights

PUMP—HORIZONTAL

4½" x 24" Worthington Horizontal Duplex Pump, Motor-

Driven Capacity 618 G.P.M. at 2000 lbs. Pressure

PUNCH & SHEAR COMBINATIONS

#91 Size 16 Hercules Universal Ironworker. Capacity

Punch 1-1/16" x ¼", Shear Plate ¼", Flat 6" x

¾", Angles 6" x 6" x ¾", Round 1¾", Square 1¾",
48" Throat Hilles & Jones Single End Capacity 1¾",
thru 1"

No. 5 Hilles & Jones Single End, Motor Drive, Ca-

pacity Punch 2" thru 1½", 48" Throat

No. 2½ Buffalo Universal Ironworker with Built-in

Notcher and Coper—NEW 1948—Capacity Punch

1¾" thru 2", Shear 2¼" Round, 2" Square, etc.

ROLLING MILLS

9" x 20" Schmitz Single Stand Two High

18" x 60" United Three High Mill, 2 High

20" x 30" Farrel 2 Stand 2 High

20 x 30" Mackintosh Cold Reduction Mill

25¾" x 60" Mack-Hemp 3-Stand Breakdown Mill

33 x 76" Three Stand Two High Roughing Mill

ROLLS—PLATE STRAIGHTENING

72" Berthel No. 12 Plate Straightening Roll, Motor

Driven, Seven 11½" Dia. Rolls, Capacity ¼" Plate

96" Newbold Plate Straightening Roll, 11 Rolls 8"

Diameter

72" McKay Plate Straightening Roll, M.D., 12" Diameter

ROLLS—TAPER FORGING

10" x 12" Mesta Single End, Motor Drive

12" x 10" Garsch, Motor Driven

SAWS

26½" Kling Friction Saw, Motor Driven. Hydraulic

Feed. Complete with Pump & Motors

48" Kling Friction Saw, Motor Driven Hydraulics

Feed. Complete with pump and motor

SHEAR—GATE

8" x 1" Cincinnati Gate Shear, 24" Gap, Motor Dr.

SHREWS—ROTARY

No. 8A Quickwork Rotary Shrew, 10" Gauge Capacity.

Equipped with circle cutting attachment

No. 25A Quickwork Rotary Shrew, ¼" Capacity

No. 40A Quickwork Rotary Shrew, ½" Capacity

No. 60 Quickwork Rotary Shrew, ¾" Capacity

No. 100 Kling Rotary Shrew, 1" Capacity

SHREWS—SQUARING

6" x 10 Ga. Niagara

10" x ¾" Cincinnati No. 2510, V-Belt Drive

12" x 10 Ga. Hertsch, Motor Driven

SLITTERS

25" Torrington Gang Slitter, Capacity 5 Cuts 256"

Complete with scrap cutter, coller, elec. equip.

36" Yoder G-36 Slitter, Capacity 10 cuts 16 Ga.

Complete with Uncoiler and Reroller, M.D.

72" Yoder Gang Slitter, Capacity 5 Cuts 20 Ga.

STRAIGHTENERS

¾" Shuster Straightening & Cut-Off Machine 30' Cut-

Off, Motor Driven

No. 90 Morris Straightening Machine, M.D. Capacity

¾" to 1½" bars or tubing ½" dia. any length

No. OA Morris Straightening Machine, Arr. M.D.

Capacity ¾" to 1" Diameter, any length

Kane & Roach Rotary Straightening Roll, Capacity

THE CLEARING HOUSE

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STANDARD GAUGE LOCOMOTIVES

1—10-Ton, 0-4-0, Gasoline, Whitcomb
1—18-Ton, 0-4-0, Gasoline, Plymouth
1—20-Ton, 0-4-0, Gasoline, Plymouth
1—25-Ton, 0-4-0, Gasoline, Plymouth

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1—10-Ton, 0-4-0, Diesel-Mechanical, Plymouth
1—30-Ton, 0-4-0, Diesel-Mechanical, Vulcan

1—25-Ton, 0-4-0, Gasoline-Electric, Porter
1—70-Ton, 0-4-4-0, Propane-Electric, Plymouth
1—83-Ton, 2-6-2, Steam, Oil-Fired Saddle Tank
2—160-Ton, 2-8-0, Steam, Coal-Fired, American

5—Gondola, 50-Ton, All-Steel, 40'6",
4'7" Sides
10—Flat, 70-Ton, 41'6"
10—Flat, 50-Ton, 41'6"
1—Flat, 50-Ton, 43-Ft., S/U

1—End Dump, 20-Yd., 50-Ton, Western,
Automatic Air, DROP DOORS
1—End Dump, 10-Yd., All-Steel, LIFT
DOOR
1—Box, 40-Ton, 40', Single Sheathed
5—Box, 50-Ton, 50', All-Steel

11—Passenger, 64'6", All-Steel, 90,500 Lbs. Lt. Wt., Seating Capacity 72 Persons

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Rolling Mills and other Steel Plant Equipment carrying new equipment guarantee and available within 90 days of order.

1—38" 2-HI Reversing Blooming Mill, complete with motor, tables, manipulator, shears and auxiliary electric equipment.
1—30" 2-HI Reversing Mill, with motor and drive, tables, manipulator optional.
1—28" 2-HI Reversing Blooming Mill, with tables, manipulators and motor.
1—1500 horsepower motor 3 phase, 60 cycle, 2300 volt, with Falk S 15, gear reducer.
1—1-Stand, 3-HI 18" Bar Mill with tilting tables, shears, furnace, etc., and all motors and electric equipment.

1—3-Stand Tandem Cold Mill, 12" x 22" 2-HI Mills with recoiler and motors.
10½" dia. x 14" Face 2-HI Standard Mill, Roller Bearing equipped, complete with drive and motor.
1—10" x 12" 2-HI Bliss Cold Mill with recoiler.
1—6" x 6" 2-HI McWilliams Cold Mill with edging rolls and recoiler.
1—3-Stand Tandem, 4-HI Cold Mill, 4" x 16" x 12", roller bearing equipped, with motors and recoiler.

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#3MS Cincinnati Dial Type Plain Mill
BL-2416 Keller Duplicator
9-J Gorton Electric Duplicator
5" Sellers FLOOR TYPE Horizontal Boring Mill
3" "Tri-way" #30 UNIVERSAL Horizontal
Boring Mill
16" Gould & Eberhardt Tool Room Shaper

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MACHINE TOOLS, INC.**
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PLATE SHEAR
Cincinnati 8'x1" All Steel with 24" gap, hydraulic holdown, air counterbalance, front and rear gauges, 30 HP. Motor 3/60/220-440 volts and including Air Compressor Outfit. New 1942. Excellent condition. Immediate release.

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3½ BAKER Keyseater, 4" x 24" keyways, AC-MD, with equipment.
48" x 30" NILES Heavy Duty Geared Head Lathe, new 1940.
2L GISHOLT Turret Lathe, new 1942, Pre-selector Head, bar feed, collets, hardened ways, taper attach., AC motor. Price \$5,850.00.
100" SELLERS Vertical Boring Mill, 2 swivel heads, rapid traverse, Motor Drive, New 1935.

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14' NILES VERT. BORING MILL, 2 Rail Heads, 120" Table. Excellent Condition.

42" x 36" x 16" INGERSOLL PLANER MILLER, 3 Heads.

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PHILADELPHIA COLD ROLLING MILL
20" x 36", (Extra Rolls 16" x 48", 20" x 42") with Sealed Reduction Drive.
NEWBOLD 3-HI BAR MILL with extra Rolls and 2-Hi Finishing Stand.

4 Continuous Non-Ferrous Rod Benches suitable for Aluminum or Copper.

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LATHE—GUN BORING, 64" x 65" (late)
PLANER—GRAY, 60" x 60" x 40" (Tolerance 003)
PRESS—TOLEDO, #185, 1440 tons, D.A.
SHEAR—R. D. Wood, 7" x 1", 18" gap

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PLAZA 7-3471

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**85,000 sq. ft. of
Floor Area**

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and Lake Erie
Railroads**

Good Utilities



**Brick and Steel
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**Modern Production
Equipment**

**Located in City
of 25,000**

This modern Iron and Brass Foundry in Monessen, Pa., is to be liquidated. Will sell buildings, land and equipment, wholly or in part. Equipment includes 1 No. 9½ Whiting cupola; 30 molding machines; 1 gas fired melting furnace; 7 cranes, 2-10

ton; 1 motive type sand slinger; 1 Rotoblast; 1 Tumblast; 2 Motowlift trucks; 4 gas fired core ovens (one never used); 4 Simpson sand mixers—also pattern shop with complete equipment; flasks, jackets, hoists and miscellaneous items.

Contact

MONESSEN FOUNDRY DIVISION — ROCKWELL MANUFACTURING COMPANY
MONESSEN, PA.

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10" Newton, cone
12" Bement-Miles, m.d.
13" Canada, m.d.
20-24" Dill, m.d.
48" Niles-Bement-Pond Geared, m.d.

TAPPERS

No. 1 Bakewell Precision, m.d.
No. 1H Bakewell Precision Radial Tapper, m.d., latest
No. 2 Bakewell Precision, m.d.
Bausch Radial Drilling & Tapping Machine, m.d., latest
No. 10 Kaufman High Duty Oscillating Pneumatic, m.d.

MISCELLANEOUS

No. 2A Pratt & Whitney Jig Borer, m.d.
Gisholt Precision Balancing Machine, m.d.
96" Ohio Extra Heavy Worm Feed Revolving Table, m.d.
40" Tolhurst Chip Wringer, m.d.
Derrick & Harvey 2 spindle Profiler
No. 12M Morey 2 spindle Profiler, m.d., latest
No. 12 Pratt & Whitney 2 spindle Profiler, m.d.
No. 20 PH A.D. Cook Deepwell Pump with Chrysler
Engine and 200' of 8" pipe, brand new
Wagner Saw Sharpener, m.d.
Gogan Hardness Tester, Model 1618
Logan Hydraulic Vertical Shaper, m.d.
Omn Electric Plants, Model WC 625-S, brand new
Wicaco Standard Patented Continuous Oil Groover, m.d.
No. 1 Fischer Oil Groover, m.d.

MANUFACTURING TYPE MILLING MACHINES

No. 0 Sundstrand Rigidmill, m.d., latest
No. 08 Cincinnati Model EA, m.d., latest
No. 12 Brown & Sharpe, m.d.
No. 1-12 Cincinnati, m.d., latest
No. 2-18 Cincinnati, m.d., with rise and fall, latest
No. 2-24 Cincinnati, m.d., latest
No. 2-24 Cincinnati, m.d., with rise and fall, latest
No. M24 Kearney & Trecker Production, m.d., latest
No. 4-48 Cincinnati Plain Hydromatic, m.d., latest
No. 4-48 Cincinnati Duplex Hydromatic, m.d., latest
No. M30 Milwaukee Simplex, m.d., latest
No. 34-36 Cincinnati Duplex Hydromatic, m.d., with tracer control, latest

No. 34-36 Cincinnati Plain Hydromatic, m.d., with tracer control, latest
No. 34-60 Cincinnati Plain Hydromatic, m.d., latest
No. 56-72 Cincinnati Duplex Hydromatic, m.d., latest
No. 56-90 Cincinnati Duplex Hydromatic, m.d., latest
Type P Ohio Mfg., m.d.

Sundstrand Rigidmill, m.d.
Pratt & Whitney Spine, m.d.
No. 38 Kampsmith Mfg., s.p.d.
18", 24" Cincinnati Plain Automatic, m.d.
24", 48" Cincinnati Duplex Automatic, m.d.
30"x36"x12" Ingersoll Slab Milling Machine, 2 heads, m.d.
72"x10" Ingersoll Single Horizontal Spindle Traveling Housing Milling Machine, m.d.

THREAD MILLING MACHINES

U6 Automatic Hob, m.d.
No. CT-36 Lees-Bradner, m.d., latest
No. CT-54 Lees-Bradner, m.d., latest
Hall Planetary, m.d.
4½"x12" x14" x20" x48", 6x30" Pratt & Whitney
10x24" Hanson Whitney, m.d., latest
10x48" Hanson Whitney, m.d.

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United States, vee belted, m.d.
No. 1 Kent Owens, m.d.
Atlas Model MF Bench, m.d.
No. 1 Standard, m.d.
No. 2 Productomatic, m.d.

PLANERS

P10 Coulter Crank Type Shaper-Planer, 1 head, m.d.
20"x20"x5" Whitcomb-Baldell Planer, belted m.d., 1 head
24"x24"x6" Cincinnati, m.d., 2 heads
30"x30"x10" Cincinnati, belted m.d., 2 heads
30"x30"x10" Gray, 2 heads, belt
30"x30"x10" Gray, 2 heads, belt
32"x32"x10" Gray, 2 heads, belt
36"x28"x10" Cincinnati Double Housing, m.d., two rail heads
36"x36"x8" Gray, belt
36"x36"x10" Cincinnati, belted m.d., 2 heads
36"x36"x10" Niles, 2 heads, belt
36"x36"x12" Cincinnati, belt

56"x36"x14" Cincinnati Hypro D.H. Planer, two rail heads, two side heads, latest
36"x36"x16" Cincinnati Hypro D.H. Planer, two rail heads, two side heads, latest
36"x36"x18" Niles-Bement-Pond, 2 heads, reversing m.d.
36"x36"x20" Cincinnati, 2 heads, belt
36"x36"x20" Gray, 2 heads, belt
38"x36"x20" Cincinnati, belted m.d., 2 heads
38"x36"x20" Gray, 2 heads, belted m.d.
48"x48"x18" Detrick & Harvey, 4 heads, reversing m.d.
48"x48"x22" Cincinnati Hypro D.H., two rail heads, two side heads, latest
48"x48"x28" Cincinnati, 4 heads, reversing m.d.
48"x48"x30" Cincinnati, 4 heads, m.d.
48"x48"x32" Niles-Bement-Pond, 4 heads, reversing m.d.
48"x48"x40" Sellers, 2 heads, reversing m.d.
62"x42"x40" Cincinnati, 4 heads, reversing m.d.
66"x60"x40" Niles-Bement-Pond, 4 heads, reversing m.d.
72"x62"x22" Cincinnati Hypro Electronic Planer Type Mill, 4-8" quills, 30 H.P. each head, latest
72"x62"x30" Cincinnati Hypro, 2 rail heads, 2 side heads, latest
72"x72"x36" Niles, 4 heads, reversing m.d.
96"x72"x18" Pond, 4 heads, belted m.d.

PRESSES

48"x36" Chambersburg Cecostamp Air Operated
No. 1 Loshbaugh-Jordan O.B.I. Power Press, m.d.
No. 4 Johnson Open Back Inclinable Power Press, m.d.
No. 20B Bliss Open Back Inclinable Back Geared, m.d.
Ferracote Double Crank, 36" between uprights, 84 ton cap.
96"—400 ton Niles Driving Wheel Press, m.d.
Chambersburg 30 ton Hydro-Pneumatic Metalwood B 45
No. 7 and 8 Thomas Punches, latest

SAWS

6x6" Peerless Universal, m.d.
7½" H.P. Cincinnati Elec. Tool Co. Abrasive Cut-Off Machine, type JCAW
DeWalt Model MEI Abrasive Cut-off Machine, m.d.
No. 3 and 8 Nutter & Barnes Cold Saws
No. 6 Cochran Bly Cold Saw
No. 138 Espan Lucas Cold Saw, m.d.
Gustav Wagner Cold Saw, m.d.

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AIR COMPRESSOR

1000 Cu. Ft. Worthington "Feather Valve," 18" x 11" x 14" two stage with 185 HP synchronous motor on shaft.

AUTOMATIC

4 1/2" Conomatic 4 spindle, serial No. 219IK with reel, chip conveyor, extra equipment.

BORING MILLS

4 1/2" bar Lucas No. 33. Table 46" x 64". Max. height 36", Max to outboard support 11".

100" Niles Bement Pond. Extra heavy type. 2 swivel heads, power rapid traverse, 35 HP direct current motor.

BROACH

15 ton 36" stroke American vertical duplex surface with tilting type workholder.

DRILL

42 spindle, No. B16 Natco multiple with 18" x 48" drilling area and two box tables.

GEAR HOBBER

Type T Barber Colman. Designed for either straight or taper splines, helical or spur gears. Also type A and Nos. 3 & 12 Barber Colmans.

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6" x 18", No. 10 Brown & Sharpe "Electric Hydraulic" Three with and two without spindle oscillation. New 1940 and 1941.

10" x 36" Norton type C hydraulic with hydraulic quick in-feed. Serial No. C16453, new in 1942.

10" x 72" Norton type C hydraulic made at factory to swing 14". Serial No. 21750, new in 1944.

23" x 36" Norton type C with mechanical table traverse, hydraulic quick in-feed. Serial No. C18281, new 1943.

LATHE TURRET

No. 2FU Foster Fasteumatic Serial No. 2FU529, new in 1944. Quite a little tooling.

MILLERS

Cincinnati Hydromatic Sizes: 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint Coining. 2 1/2" stroke, 18" shut height, bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, model F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 2316 1/2 eccentric shaft forging. Stroke 4"; shut height 16" bed 28" F to B x 23 3/4" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 11 1/2" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft. 30 HP motor.

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SAGINAW, MICH.

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Bullard 24" Spiral Drive, Vert., LATE TYPE
Bullard 24" "New Era" Vert., FIRST CLASS

King 34" Vert., 3 scd., Turret Head
N B P 36-44 Vert., 12 speeds

Bullard 42" High Speed Spiral Drive, Vert., LATE TYPE

King 52" Heavy Duty, Vert., 1 swv. hd., 1 turret hd.

Gisholt 72", Vert., 2 swv. hds. on rail, power rapid traverse

P & H, 4" spindle, Horiz.

Defiance #6, 4 1/2" spindle, Horiz.

Heald #44, Borematic, Three Heads, LATE TYPE

Heald #49 Borematic, Single End, LATE TYPE

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Sundstrand #56 x 24", NEW 1945

LATHES

Lodge & Shipley 16" x 30" centers, Late type

Boye & Emmes 16" x 54" centers, Late type

Monarch 16" x 54" centers, Late type

Reed Prentiss 16" x 54", Late type

American 18" x 10", GH, 8 speed

Lodge & Shipley 22" x 12" centers, Late type

American 24" x 8", GH, First Class

American 24" x 12", GH, First Class

Niles Timessaver 30" x 10" centers, First Class

American 36" x 12", GH, 12 speed, First Class

American 62" x 18" centers, 3 scd., qc

TURRET LATHES

Warner & Swasey #1A, LATE TYPE

Warner & Swasey #2, LATE TYPE

Warner & Swasey #2A, Univ.

Warner & Swasey #3, Univ., LATE

Warner & Swasey #4, Univ.

J & L #7A, Univ., LATE TYPE

Gisholt #4, Univ. Ram type, LATE TYPE

MISCELLANEOUS

CINCINNATI #2, DIAL TYPE, VERT. MILLER

CLEVELAND 48 x 48 x 12' OPENSIDE PLANER

CINCINNATI PUNCH & SHEAR, 36" THROAT

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I-50 ton HENRY & WRIGHT DIEING PRESS 5" str. dbl. rl. Fd. Scrap Cutter Reeves Drive W/M
I-25 ton HENRY & WRIGHT DIEING PRESS 1/2" str. dbl. rl. Fd. Scrap Cutter Grd. Fly whl. W/M
I-CLEVELAND PRESSES O.D.I. 65 ton MOD. 81 AIR CUSHION, Geared F.W. W/M
I-74 1/2 BLISS POWER PRESS, 90-ton, Open Back C Frame W/M
I-200 BLISS INCL. POWER PRESS 1" Stroke, DM. RI. Fd. Scrap Cutter W/M
I-TOLEDO HORNING PRESS Mod. 14 1/2 Geared F.W. W/M
I-KEARNEY & TRECKER "SIMPLEX" MILLER 2120
I-CINCINNATI VERT. MILLER Mod. 98
I-#2 BAKEWELL TAPER Nov. 1944
I-ROOT 16 SPINDLE HYDR. DRILL PRESS
I-HALL PLANETARY THREAD MILLER Mod. 8
I-NATIONAL RIVETERS Mod. 8 9/16 x 1/2"
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3" Ajax Single Stroke Solid Die Ball Header, rated capacity 4 1/2" balls, suspended slides, air clutch

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Ajax & Acme Upsetting & Forg. Machs., not suspended slides, 3/4", 1", 1 1/2", 2 1/2", 3"

W. W. Bulldozers, #1, #2, #3, #4, #5, #4 High Speed

Drop Hammers, 800# to 2500#

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Trimming Press, \$59 1/2 Toledo, 385 ton; other trimmers 55 to 200-ton

L. & A. Plate Shear, Cap. 1" x 12'

Bar Shears, Open & Guillotine, 5/8" to 7" Rd. Ferracute #6 Solid Back Geared Press, 100-ton

Minster 88-ton S.S. Press, 16" stroke

Solid Back Presses, 20 to 100-ton

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Single & Double End Punches, various throat depths and caps.

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L. & A. Multiple Punch, 10', 350-ton

Ryerson Serpentine Throatless Shear, 1/2"

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Flanging Machine, McCabe, cap. 3/4"

Bertsch Straightening Roll, 1"x68"

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1500 gallons per minute @ 125 P.S.I.; directly connected to one 200 H.P. G.E. Induction Motor; 2200 Volts, 45 A., 1760/RPM.

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1000/GPM; 35-ft. HD.; 1750/RPM; directly connected to one 15 H.P. G.E. Induction Motor; 1145/RPM; 440 Volts, 25 A.

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No. 87064; 1750/RPM; 600/GPM; 810-ft. HD. UNION (Single Stage) CENTRIFUGAL PUMP 700/GPM; directly connected to one 50 H.P. G.E. Induction Motor; 2300 Volts, 12 A., 1730/RPM.

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4" suction; 2" discharge; directly connected to one 15 H.P. G.E. Induction Motor; 1755/RPM.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP, No.

2" suction; 2" discharge; directly connected to one G.E. 15 P. Induction Motor; 440 Volts; 18 A.; 1755/RPM. No. 463973

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP

4" suction; 2" discharge; directly connected to one 15 H.P. G.E. Induction Motor; 440 Volts; 19.2 A.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP

4" suction; 2" discharge; directly connected to one G.E. 15 H.P. Induction Motor; 440 Volts; 1760/RPM.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP

4" suction; 2" discharge; directly connected to one Allis-Chalmers; 20 H.P. Motor.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP

6" suction; 5" discharge; directly connected to G.E. 15 H.P. Induction Motor; 440 Volts; 18.9 A.; 1750/RPM.

LEA-COURTNEY (Single Stage) CENTRIFUGAL PUMP

3" suction; 2½" discharge; directly connected to Westinghouse 7½ P. motor; 440 Volt; Type CS; 1750/RPM. Induction Motor.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP

75/GPM; 4" suction; 3" discharge; directly connected to G.E. Induction Motor; 10 H.P.; 440 Volts; 12.4 A.; 1740/RPM.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP

700/GPM; 50-ft. HD.; 1750/RPM; No. 5756; directly connected to G.E. Induction Motor; 40 H.P.; 2300 Volts; 10 A.; 1735/RPM; No. 3942242.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP, size CS8

1610/GPM; 39-lb. HD.; 1150/RPM; directly connected to G.E. Induction Motor; 60 H.P.; 2200 Volts; 14.5 A.; 1155/RPM; No. 3084620.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP

700/GPM; 5016-ft. HD.; 1750/RPM; No. 5756; directly connected to G.E. Induction Motor; 40 H.P.; 2300 Volts; 10 A.; 1735/RPM; No. 3942242.

INGERSOLL-RAND (Single Stage) CENTRIFUGAL PUMP, size 6HFV

1500/GPM; 100-ft. HD.; 1750/RPM; No. 6785; directly connected to G.E. 50 H.P. Induction Motor; 2200 Volts; 12.5 A.; No. 5263251.

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WORTHINGTON CENTRIFUGAL PUMP, 6" suction; 5" discharge

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DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP, size CS5

No. 5754; 700/GPM; 4016-ft. HD.; 1750/RPM; directly connected to G.E. Induction Motor; 40 H.P.; 2200 Volts; 10 A.; 1735/RPM; No. 3942242.

DAYTON-DOWD (2-stage) CENTRIFUGAL PUMP, size CS14

500/GPM; 131-ft. HD.; 1150/RPM; No. 18241; directly connected to G.E. Induction Motor; 440

2½" suction; 2" discharge; directly connected to G.E. Induction Motor; 7 H.P.; 440 Volts.

LEA-COURTNEY (2-stage) CENTRIFUGAL PUMP, No. S28608

500/GPM; 50-ft. HD.; 1750/RPM; directly connected to Terry Steam Turbine No. 7080; 185/PSI Steam; 110 H.P.; 3000/RPM.

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300/GPM; 4016-ft. HD.; 1750/RPM; Size 3; No. 101488; Model Spec. directly connected to G.E. Induction Motor; 15 H.P.; 440 Volts; 18.8 A.; 1760/RPM; No. 4054248.

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DE LAVAL (Single Stage) CENTRIFUGAL PUMP

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DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP, No. KC38295

2½" suction; 2" discharge; directly connected to G.E. Induction Motor; 5 H.P.; 440 Volts; 7.1 A.; 1140/RPM; No. 167310.

DAYTON-DOWD (Single Stage) CENTRIFUGAL PUMP, Type CS5

250/GPM; 4016-ft. HD.; 1750/RPM; No. 5757; directly connected to G.E. Induction Motor; 15 H.P.; 440 Volts; 18.8 A.; 1760/RPM; No. 4053995.

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515/GPM; 265-ft. HD.; 3510/RPM; no serial number available.

DENMING-MUELLER (Single Stage) CENTRIFUGAL PUMP, DC50067

200/GPM; 40-ft. HD.; 1750/RPM.

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Type FS-1 Gas; Year-1945; 14" x 19" x 13"

steam pressure; 110/PSI; discharge 30/PSI; 250/RPM.

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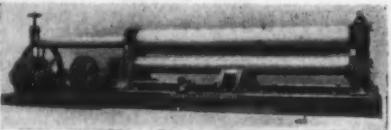
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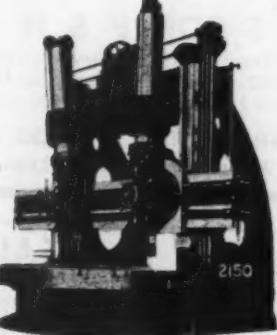
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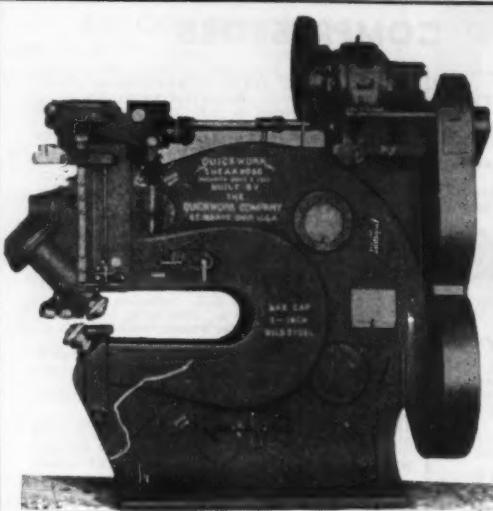
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1**	700	G.E.	MT-482	2200	400
1**	600	G.E.	MT-412	2200	729
1	500	G.E.	IM	2200/4400	590
1	500	Whse.	CW	2200	575
1	500	Whse.	CW	440	600
1	400	G.E.	IM	2200	875
1**	400	G.E.	IM	2200	590
1**	400	Al. Ch.	ANY	2200	585
2	400	G.E.	MT-412	2200	450
1	300	G.E.	IM	2200	1200
1	300	Al. Ch.	ANY	2200	585
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2	150	C. W.	900	250	2300/440	
1	100	C. W.	900	250	2300/440	
1	85	C. W.	1200	250	440	
1	75	Whse.	1200	125	440/220	
1	75	Al. Ch.	900	250	2300	
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1	500	G.E.	MPC	160/320
1	400	Al. Ch.	MII	400/1200
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1	300	Whse.	QM	450/900
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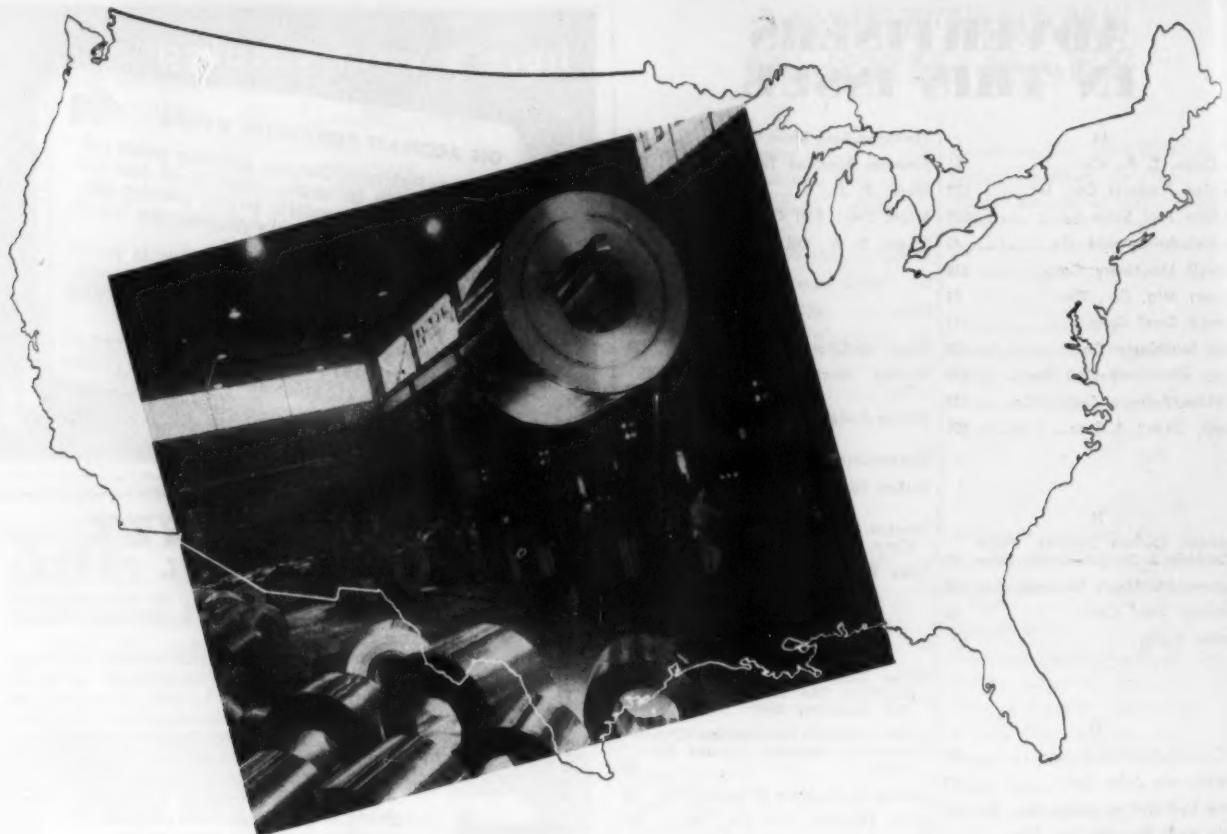
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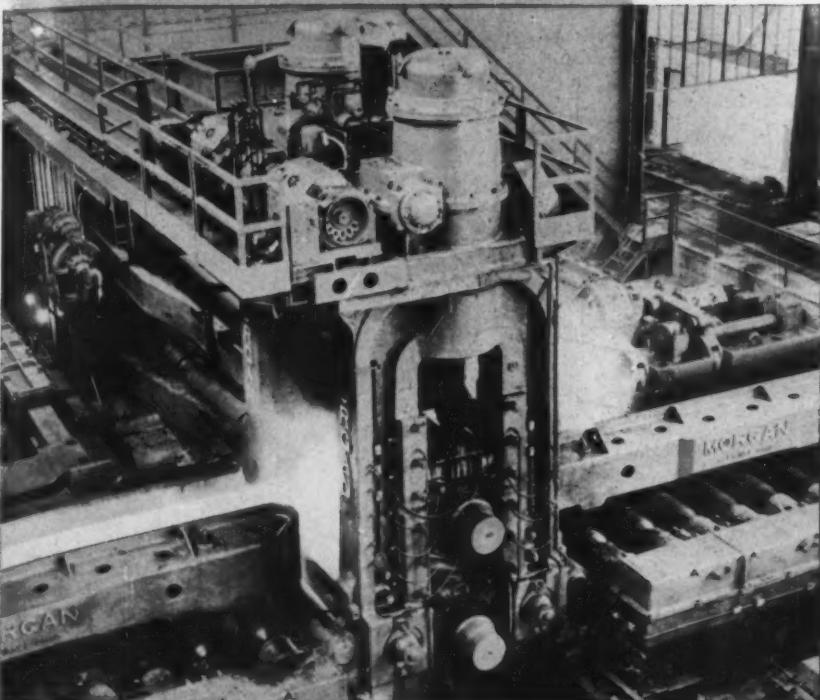
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OIL AND GREASE SYSTEMS

How TIMKEN® bearings tame a 2,000,000 lb. force

WHEN the giant Mesta plate leveller below goes to work there's a separating force on each work roll of over 2,000,000 pounds! Taking this tremendous load are the Timken® tapered roller bearings on the back-up rolls.

Equally important in the operation of this leveller are the Timken bearings on work rolls and pinch rolls.

Timken bearings are used because they're built to take the toughest loads. Line contact between

rollers and races gives them extra load capacity. Their tapered construction takes radial and thrust loads in any combination. They are made of extra tough, wear-resistant Timken steel and manufactured to amazingly precise limits.

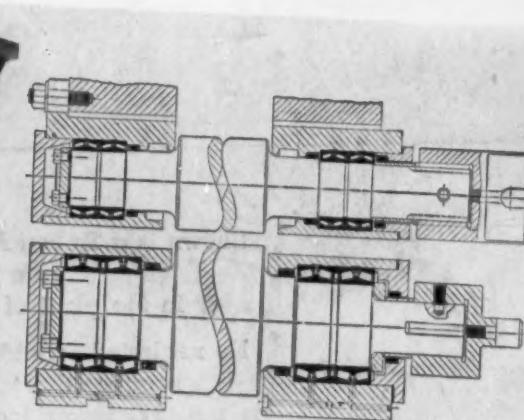
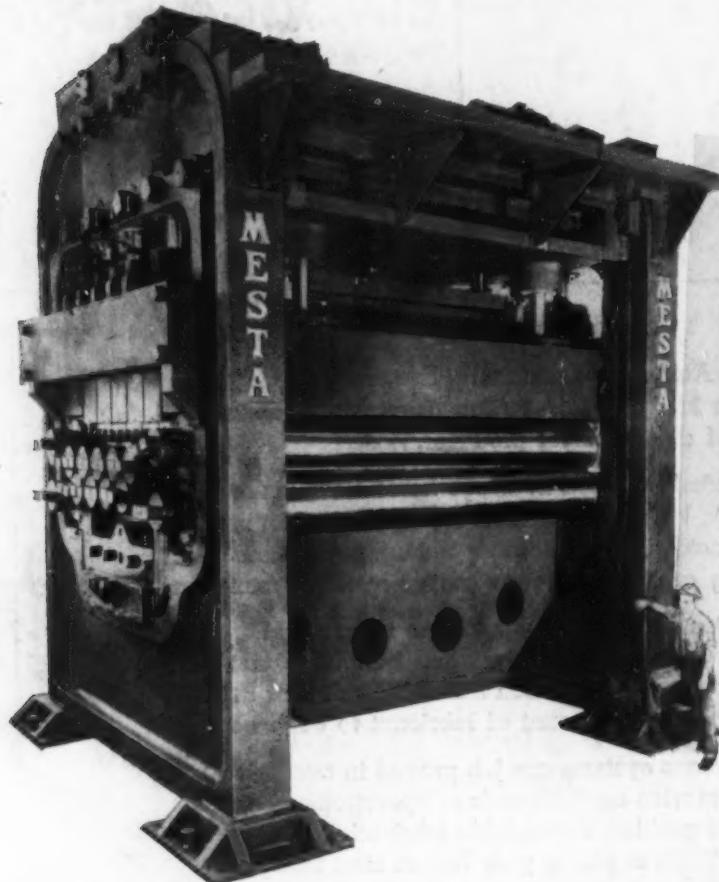
As a result, Timken bearings keep the rolls rotating freely—in perfect alignment—under terrific loads. They reduce friction to a minimum and accelerate easily to top speeds, preventing marking of work rolls

and material. They cut down wear and maintenance.

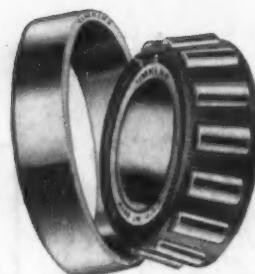
Because of these advantages, Timken bearings are now used on the back-up rolls of practically all makes of levellers! Make sure the bearings in the machines you build or buy are stamped with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".



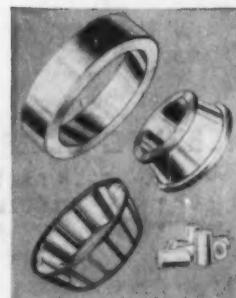
This symbol on a product means its bearings are the best.



How MESTA MACHINE COMPANY uses Timken bearings on work rolls and pinch rolls in plate leveller at left. Machine also has Timken bearings on back-up rolls, table rolls and gear drive—170 in all—for smooth, long-lived operation.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



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